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STATE HIGH SCHOOL

Manual

for

NORTH DAKOTA

JULY 1915

A MANUAL FOR THE USE

OF THE

STATE HIGH SCHOOLS

OF NORTH DAKOTA

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PREFACE

This manual is published for the use of school officers, superintendents, principals and teachers. Its purpose is to state conditions of classification, rules governing examinations and courses of study, and to indicate briefly the amount and character of work required in each subject. This manual supersedes all other circulars and letters of instruction from the state board of education.

I. STATUTORY PROVISIONS

STATE HIGH SCHOOL AID LAW

Section 1430 of the Compiled Laws of North Dakota for the year 1913, delegates powers regarding the State High School Aid Plan to the State Board of Education.

Section 1431 states what schools may be classified and what pupils may receive free tuition in these schools.

Section 1432 fixes certain requirements for classification of schools, such as heating, lighting, ventilating and all sanitary conditions, courses of study in elementary and high schools, and states who may visit and inspect these schools.

Section 1433 was amended by the Assembly of 1915 and may be found in the Session Laws of 1915, House Bill No. 417. It provides for the office of State High School Inspector; his appointment, salary and expenses. It makes an annual appropriation of $85,000; $12,500 for five schools having an agricultural department, and $72,500 for expenses of administration and to be apportioned to schools of the 1st, 2nd, and 3rd class,—$800 to schools of the 1st class list, $500 to those of the 2nd class list, and $300 to those of the 3rd class list,—but if after the necessary expenses are paid, the remainder of the $72,500 is not sufficient to apportion $800, $500, and $300 respectively, then this remainder must be prorated among the schools of the 1st, 2nd, and 3rd class lists.

Section 1434, found in the Compiled Laws of 1913, provides more specifically for the Five Schools having an agricultural department, how they are designated, what is required of them, and the power of the State Board of Education regarding them.

Section 1435 disposes of any national aid to high schools that may be voted by Congress.

Section 1436 provides for necessary clerical service, salary and expenses of same, and for any other necessary expenses of administration.

Section 1437 delegates additional power to the State Board of Education and provides for assistant examiners.

Section 1438 provides for the annual report of the State High School Inspector and requires the State Board to keep a record and make a report.

Section 1439 repeals certain sections of chapter 40 of the General Laws of 1913.

STATE BOARD OF EDUCATION

The State Board of Education was created and its duties defined by an enactment of the Legislative Assembly of 1913, approved March 11, 1913. The act is chapter 149 of the Educational Laws exacted by the Thirteenth Legislative Assembly of North Dakota.

HIGH SCHOOL GRADUATES MAY TEACH

Section 1369 of the Compiled Laws of 1913 was amended by the Assembly of 1915. It was known as House Bill No. 264, and may be found in the Session Laws of 1915. It provides that a graduate of a four-year high school who has done the work in psychology, school management and methods of instruction and three senior reviews may have his diploma accredited as a second grade elementary certificate.

II. RULES AND REGULATIONS

A.—Application for Classification

1. High Schools desiring classification for state aid shall make application to the board through the high school inspector on or before November 1st of each year, on blanks furnished by the inspector on application.

2. Schools applying for classification after all funds appropriated for aiding high schools are exhausted may be classified as state high schools without aid and be entitled to the same privileges of examination and certificates as free state high schools receiving aid.

B.—Conditions of Acceptance

1. There shall be a well organized elementary school with a course of instruction of such elementary school, corresponding substanially to the eight years' course prescribed by the department of public instruction for common and graded schools, or the courses of the first six years shall be of this nature and the work of the seventh and eighth years may be made to articulate with that of the high school in plan and method.

2. Third class high schools shall have not less than four rooms or departments and at least one laboratory and recitation room; second class schools shall have not less than five rooms or departments and two additional rooms for laboratory and recitation work; first class high schools shall have not less than five rooms or departments and a sufficient number of additional rooms for laboratory and recitation purposes, at least three.

3. The minimum number of teachers in third class high schools shall be five, which includes the principal and one assistant high school teacher; second class high schools seven, including the principal and two assistants in high school; and first class high schools, eight, including the principal or superintendent and three assistants in high school.

The high school assistants shall give all of their time to the high school; or in case there may be some good reason for having them give some time to the grades, the equivalent of this time shall be returned to the high school by a teacher who is qualified.

4. The work in all state high schools shall be of a high order.

5. Each state high school shall be provided with necessary recitation rooms, furniture, apparatus and library, to the end

that the work of the schools shall be of the highest possible efficiency.

6. The school session shall consist of at least thirty-six weeks, each year; thirty-eight weeks are recommended.

7. The superintendent shall be provided with an office and sufficient assistance in high school and office to allow him one-fourth to all of his time in school hours for general supervision over the grades and high school. In the office of the superintendent or principal there shall be kept on file, circulars, records of equipment, records of library, of enrollment, of pamplets, and correspondence pertaining to the school, scholarships, of promotions, of alumni, etc.

8. All schools accepting high school aid shall be required to keep such funds separate from the general fund, and said high school aid shall be used only for the following purposes:

Forty per cent or more for:

(a). Laboratory apparatus and supplies for all science and agricultural work in the high school.

(b). Purchase of books for high school reference library.

(c). Equipment for manual training and domestic science and art in the high school.

(d). Equipment for commercial courses in the high school.

And the remainder, if any, shall be used to assist in the payment of high school teachers' salaries.

The clerk of the school board of each school receiving aid shall submit to the state board of education, through the high school inspector, not later than April 10th, of each year, a detailed statement of all expenditures during the year of money received from state aid for high schools. The state high school aid of the following year shall be withheld from any school the clerk of which fails to make satisfactory report of the disbursement of the aid last received on or before April 10th.

9. The state board of education will classify no high school as first class in a district having an assessed valuation of less than $300,000.

10. In high schools of the first class list and in all second and third class high schools having a four-year* curriculum,

*Any high school offering in the aggregate, whether by alternation of subjects or otherwise, fifteen (15) or more units of high school work and graduating or purposing to graduate pupils from the high school, shall be considered as having a four-year curriculum for the purposes of this ruling. See section four (4) under "D.—Conduct of Schools" in this Manual.

the superintendent, principal of the high school, and assistants in the high school department shall hold the B. A. or equivalent degree from an institution of recognized standards or shall hold the first grade professional certificate, granted under the provisions of section 252 of the school laws of 1911.

In first and second class high schools, teachers of music, drawing, commercial subjects, agriculture, manual training, domestic science and art who do not teach academic subjects in high school, and who do not hold the bachelor's or equivalent degree from an institution or recognized standards or the first grade professional certificate, granted under the provisions of section 252 of the school laws of 1911, shall hold special certificates to teach these subjects, granted under the provision of section 253 of the school laws of 1911.

In third class high schools that do not offer a four-year curriculum*, if the superintendent, principal, and assistants in the high school department have not the B. A. or equivalent degree from an institution of recognized standards or the first grade professional certificate, granted under the provisions of section 252 of the school laws of 1911, they shall hold the second grade professional certificate, granted under the provisions of section 251, or its equivalent, as provided for in section 254 of the school laws of 1911.

The general school laws require that all teachers, except those in a few independent districts, shall have certificates to teach, issued by the proper authority of the state.

11. The large classes in a school, should not contain more than twenty-five pupils. If classes are large, a teacher should not be required to take charge of more than five per day. If they are small, containing but four to ten pupils, a teacher may successfully conduct seven classes per day, depending somewhat on the subjects taught. One who teaches the subject of English should not be required to instruct more than seventy-five pupils per day.

12. The state board of education shall classify as first class no school paying less than $1,300 a year to its principal or superintendent; as second class, no school paying less than $1,150 to its principal; and as third class, no school paying less than $1000 to its principal; and shall classify no high school of any grade which pays less than $67.50 per month to the assistants in the high school.

Although the state board of education requires for purposes of classification the above minimum, it recommends that the

*See note on page 10.

salary of a superintendent of a first class high school be not less than $1600 per annum; of a second class high school, not less than $1,300, and for a third class high school, not less than $1,100; further that no high school assistant should receive less than $75.00 per month.

13. No school shall be classified by the state board of education which has not an efficient heating and ventilating system, and proper sanitary conditions. Medical inspection of pupils is recommended.

C.—Classification of Schools and Additional Conditions of Acceptance

All high schools accepted by the state board of education shall be included in one of the following classes:

(a) High schools of the first class shall include all schools doing four years of work and which have complied with the following and other conditions:

1. They shall have not less than forty (40) well prepared pupils in average daily attendance and at least three assistant high school teachers.

2. The school shall have suitable and commodious quarters and shall have well established laboratory courses in three of the science courses named by the state board of education, in the program of studies for high schools.

3. They shall afford instruction in all of the constants prescribed by the state board of education as per program of studies, page 25.

4. They shall have an ample working library, including a sufficient supply of supplementary reading for each of the twelve grades.

5. In all first class high schools the subjects of music and drawing shall be taught under the supervision of a specialist or by a special instructor or by some teacher competent to supervise these subjects.

(b) The second class shall include those schools in which the course extends at least thru three years as explained under Program of Studies for High Schools, page 25, and comply with the following and other conditions:

1. High schools of the second class shall have an average daily attendance of not less than thirty (30) well prepared pupils and at least two assistant high school teachers.

2. Ample laboratory appliances for instruction in botany, zoology and agriculture, and in either physics or chemistry, for each pupil.

3. They shall afford instruction in at least three-fourths of the list of constants named in the program of studies, including manual training, cooking and sewing, page 25.

4. A selected historical and reference library for the work in history and English, and the sciences taught, and supplementary reading for the grades of the elementary school in connection.

(c) The third class schools shall be those that afford instruction in at least eight of the fifteen units of prescribed work. They shall possess:

1. An average daily attendance of at least twenty (20) well prepared pupils, and one assistant high school instructor.

2. Ample laboratory appliances for instruction in botany, zoology and agriculture, and offer at least one.

3. An ample working library and a sufficient supply of supplementary reading for each of the first ten grades.

(d) State high schools having an agricultural department, besides meeting the requirements of a state high school, shall have:

1. A superintendent, two teachers of academic subjects, and special instructors—one in agriculture, one in manual training and one in household economy.

2. A sufficient number of well equipped rooms for the pursuit of these subjects; a room each for agriculture, manual training and domestic economy.

3. Ten acres of land within one mile of the school house for use in demonstration.

For further particulars see special circular which may be secured by addressing the high school inspector.

D.—Conduct of the Schools

1. All pupils, before completing admission to the high school, shall pass a satisfactory examination in reading, writing, spelling, geography, English language and grammar, United States history and arithmetic.

It is recommended that seventh and eighth grade pupils in elementary schools connected with the state high schools take the examinations offered by the state high school examiner for entrance to high school. In order to make stronger the

articulation between the state high school system and the system of common schools of the state, it is recommended that the high schools accept for entrance, pupils from other elementary schools who have succeeded with the final examinations provided for in the course of studies for the Common Schools of North Dakota.

It is recommended further that where the six-six plan or some form of it is used, pupils be expected to pass the examination in arithmetic at the end of their ninth school year and the examination in English grammar at the end of their tenth year in school.

2. All courses are to be pursued a year of at least thirty-six weeks except when otherwise specified. A course of study pursued a minimum of thirty-six weeks, five periods per week or equivalent, each period having a duration of forty minutes in the clear, counts as a unit.

The recitation period shall be forty minutes in the clear. There should be, at least, two eighty-minute laboratory periods per week for each subject requiring laboratory work and the daily program should be arranged to conform to these eighty-minute periods.

3. English I., English II., and English III., or IV., Adv. U. S. History, Civil Government, and one unit of science shall be constants for the pupil; i. e., no pupil shall graduate from one of the state high schools without having completed these subjects. High schools of the first class are required to do a minimum of fifteen (15) units of work; high schools of the second class twelve (12) units, and high schools of the third class eight (8) units. High schools of the first class shall include in their program each year all the constants named in the list under Program of Studies, page 25, second class schools shall include three-fourths of the units of this list of constants, among which shall be three units in English, elementary algebra and one unit in science; third class schools shall include one-half of the units of these constants, among which shall be courses I. and II. in English, elementary algebra, and one unit in science.

No course, besides the constants, should be offered unless desired by four or more pupils. Other schools should not offer courses in which there are only one or two pupils to pursue them.

4. The minimum number of units of work required of pupils for *graduation* shall be fifteen (15) and no state high school whether first, second, or third class, shall *graduate* pupils who have not secured fifteen units of credit; but schools may have exercises and give *certificates* to pupils who have accomplished a smaller number of units of work.

The superintendent or principal of every state high school shall require that every pupil graduating from said high school shall be well informed in reading, writing, spelling, geography, English language and grammar, United States history, arithmetic, human physiology and hygiene ,and civil government.

It is provided by law that certain high school diplomas may by endorsement, become teachers' certificates. See page 8 of this Manual.

5. Courses in agriculture are outlined and it is urged that schools offer this work.

Manual training and domestic science and art are required in all first and second class high schools.

6. Superintendents, principals, and boards of education are urged to adopt measures to secure the pursuit by pupils of such courses as will be for the pupil's greatest benefit and make his high school course, or curriculum, have, finally, thoroness, strength and unity.

7. Certificates will be given by the examiner to successful examinees in the several subjects passed on examination. These certificates are accepted by the university, agricultural college, the state normal schools, the industrial school and the school of science in lieu of the usual entrance examinations.

8. Music and drawing shall be offered in every high school but pupils, individually, may elect to pursue these subjects or not to pursue them. Schools shall also offer courses in the elective sciences and shall be equipped for this work as specified under Classification of Schools, page 12.

9. Credits shall not be allowed in both of two subjects that are largely duplicates of each other; as, ancient history and general history, modern history and general history.

10. State high school examinations are optional; but it is urged that pupils write on all state high school examinations in so far as the subjects are offered in the school and that the mark received on the examination be used with the mark for classroom work in the ratio of one to two in securing the mark for credit in the subject in the school. If the manuscripts are not sent to the examiner, then in such cases the "principal's mark" should be used.

All of the members of a class should write, probably: because the brighter and abler a pupil is the more he should do. Lightening burdens tends to mediocrity, while healthful exercise tends to leadership. The bright pupil would better be encouraged to do good work by being promoted with honor or high honor, than be excused from part of the work, because he has done some of it well. It is the work he does that makes him grow.

11. For sound pedagogical reasons time spent in work on a subject should be an element in securing credit in the subject. It has been decided, therefore, that the Examiner shall not accept the manuscripts of the pupils unless the time the pupil has given to the preparation of the subject is at least three-fourths of a semester for one-half unit, and three-fourths of two semesters for one unit. A semester is eighteen or nineteen weeks.

12. The state board of education construes the term "Senior-reviews" as used in the law to mean such courses as those outlined in this manual in advanced United States History, high school arithmetic, senior grammar, high school geography, and writing and spelling (one-half unit), are intended to be.

The state high school board passed the following resolution May 17, 1912: "It is the sense of this board that city superintendents should direct more closely the course of students preparing to teach."

13. Laboratory notebooks are required in all sciences and the Examiner shall allow credit for them in connection with the manuscripts of the examinees. See the statements under botany and zoology, and chemistry regarding notebooks.

The laboratory work should cover the subject; hence the notebook should also. But the notebook should not contain an account of every exercise; it should contain an account of a reasonably large number of representative exercises. On the first pages there should be a complete list of exercises performed by the pupil, a second list naming the exercises done by the instructor before the class, and an added list of field trips. These lists should give the page of the notebook on which a further account, if any, is given.

Notebooks prepared for their own sakes are not wanted; for they are expected to represent efficient laboratory work.

14. Every high school library should be supplied with a few good newspapers and magazines, treating current events, and attention should be given to this subject, probably once a week.

15. Much of the time of pupils in the seventh and eighth grades is being wasted, largely because they lack interest in what is set before them to do. There is no progress in the educational processes without interest, whether the cause of this interest be immediate or remote.

At the age of twelve or thirteen the period of adolescence begins and the attitude of the youth toward his environment changes. Subjects and methods of instruction that were pleasing to the child may now be distasteful.

The natural place for the change from the elementary school

to the subjects and methods of the high school is at the end of the sixth grade instead of the end of the eighth grade.

Some of the subjects now attempted in the seventh and eighth grades, notably arithmetic, English grammar, and civics, are too difficult for pupils of the age of those of these grades; but some of the subjects in the high school at present, especially the so-called vocational subjects, are quite to their liking and within their powers. These, therefore, appeal to their interests, while the others do not.

In order to save time, to avail ourselves of the potency of interest, to make it convenient to provide a desirable re-arrangement of subjects, and to use more suitable methods of instruction, we should adopt the six-and-six plan.

Also, in order to meet more successfully, in the high school, the demands of present social and economic conditions, there should be a change in the content of some courses.

With these thoughts in mind, the following is suggested:

CURRICULUM

Constants	Electives
Seventh Grade—First Semester	
1. Reading, Study of Classics in English, Orthoepy, and Public Speaking.	Modern Foreign Language.
2. English Composition, Elementary English Grammar, Spelling and Writing.	Manual Training.
3. Physical Education and Geography.	Household Economy
4. Biography and United States History.	
5. Vocal Music and Freehand Drawing.	
Seventh Grade—Second Semester	
1. Reading,—Study of Classics in English, Spelling and Public Speaking.	Modern Foreign Language.
2. Arithmetic.	Manual Training.
3. Physical Education and Elementary Agriculture.	Household Economy.
4. Biography and U. S. History.	
5. Vocal Music and Freehand Drawing.	

Eighth Grade—First Semester

1. English Composition, Elementary English, Grammar and Spelling.
2. Physical Education and Arithmetic.
3. General Science.
4. U. S. History and Civics.
5. Vocal Music and Freehand Drawing.

Modern Foreign Language.
Manual Training.
Household Economy.
Commercial Work.

Eighth Grade—Second Semester

1. Study of Classics in English, Spelling, and Public Speaking.
2. Physical Education and Music and Drawing.
3. U. S. History and Civics.
4. Geography.

Modern Foreign Language.
Manual Training.
Household Economy.
Commercial Work.

Ninth Grade

1. Physical Education.
2. English I.
3. Botany I., Zoology I.
4. Community Civics, 1st Semester.
5. Ninth Grade Arithmetic, 2nd semester

Foreign Language.
Mathematics.
Commercial Work.
Household Economy.
Vocal Music.
Drawing.

Tenth Grade

1. Physical Education.
2. English II.
3. Physical Geography and Physiology. ½
4. General History I and II.
5. Tenth Grade English Grammar.

Foreign Language.
Mathematics.
Commercial Work.
Bacteriology, ½.
Horticulture, ½.

Eleventh Grade

1.	Physical Education	Foreign Languages
2.	English III	Mathematics
3.	Chemistry or Botany II and Second Half in Physiography	Household Economy Agriculture High School Geography
4.	English History ½ and General Economics ½	Commercial Work

Twelfth Grade

1.	Physical Education	Foreign Languages
2.	English IV	High School Arithmetic
3.	Physics or Chemistry	Pedagogy
4.	Advanced United States History and Civics	Psychology

Physical Education should include physiology, hygiene, physical examination and treatment, and use of the gymnasium and playground for correction and development.

Modern Foreign Language in the seventh and eighth grades should be pursued four days a week, thirty minutes per day, and one-half unit of credit might be granted. It should be taught much as English is taught in the first grade of the elementary school; there should be much easy, interesting reading, memorizing of selections, writing from dictation and conversation. But little time should be given to translation, the less the better, as it is intended the pupils shall learn to "think in the language," and shortly, speak and write as they think. They are not to use a grammar or learn vocabularies, at least for some time.

As all of the electives in this plan are to be regarded as vocational, only those who expect to make some immediate or remote use of the foreign language should attempt it.

In general, in this plan, the constants are expected to occupy three-fourths or nearly three-fourths of the time and energy of all pupils; therefore, one-fourth or more of the time and energy of the pupil will be given to the elective, vocational, subjects. If he knows what his vocation is to be, let him pursue the subject that prepares in a measure directly for that vocation; if he does not know, let him try different subjects in the hope that by so doing he may "find himself." Let all of the subjects be so well organized and so well taught as to afford discipline as well as culture and useful information.

The instruction in the seventh to twelfth grades, the junior and senior high schools, should be largely departmental; but in the first to sixth grades it should be by grades, except probably music and possibly drawing and penmanship.

Geography as commonly offered in the elementary school should be completed in the eighth grade, **arithmetic** in the ninth grade, and**English grammar** in the tenth grade.

Community Civics is a course in which the pupils are taught what is done in the community and paid for from a common treasury, or treasuries; who does it; how he does it; by what authority; and what he receives for doing it. It is not a textbook course; but one into which the teacher puts initiative, energy, and personality.

In the focus of this plan is the greatest good of the child and the state,**state** being used in its generic sense. The plan does not prevent college entrance, as that entrance is or as it may be. If college entrance is desired as a result of high school work, care should be taken in selecting electives so as to meet entrance requirements.

If penmanship has been rightly taught in the elementary school, some time for review and drill is probably all that is necessary in the seventh and eighth grades.

Some system of credits should be adopted for the six-year high school work. It might be well to assign credits for each subject mentioned in this plan, such that the credits for the constants would be in the aggregate eighteen units, and require from the electives at least, five units more for graduation.

Rules for Conducting High School Examinations

All superintendents, principals and teachers in the high school department, appointed to conduct examinations of the state examiner, are required to read Rules numbered *3, 4, 5, 6, 7, 8, 9, 10, 11,* to the class before beginning examinations.

(*Many mistakes in conducting and reporting these examinations would be avoided, if those who conduct and report them would read these rules carefully and also other statements sent them by the examiner.*)

Examinations will hereafter be given subject to the following rules—*which must be strictly followed*:

1. Two examinations will be offered each year. The first examination will begin on the Monday of the week in which the 21st of March falls, (counting Sunday as the first day of the week) and will include the subjects in the program of studies, pages 25-26 of this annual which are marked with

the asterisk and no others. The second examination will begin on the first Monday in June and will include all subjects on pages 25-26 except those marked with a dagger.

For the school year 1915-16, the state high school examinations will take place March 20-24 and June 5-9, 1916.

No examinations shall be held on Saturday.

The examinations in the several subjects will take place in the following order:

First Day

English Grammar, 8th grade, a. m.
Latin Grammar, a. m.
Vocal Music
Vergil, a. m.
English II
Modern Languages, p. m.
Arithmetic, High School
Senior English Grammar

Second Day

Arithmetic, 8th grade, a. m.
English I
Solid Geometry, a. m.
Advanced Algebra, a. m.
Trigonometry, a. m.
Caesar, a. m.
Drawing, Freehand
Adv. U. S. History (high school) p. m.
Civics. (high school) a. m.
High School Geography

Third Day

Geography, 8th grade, a. m.
Physical Geography, a. m.
Botany I, a. m.
Botany II, a. m.
Zoology I, a. m.
Zoology II, a. m.
Elementary Algebra, p. m.
English III
English IV
Bookkeeping ½ unit
Drawing, Mechanical

Fourth Day

U. S. History, 8th grade, a. m.
Ancient History, a. m.
Modern History, a. m.
English History, a. m.
General History I, a. m.
General History II, a. m.
Plane Geometry, p. m.
Political Economy, p. m.
Agriculture
Chemistry
Penmanship and Spelling (high school)

Fifth Day

Reading, Spelling and Penmanship, 8th grade
Physiology (high school) a. m.
Physics, a. m.
Cicero, p. m.
Pedagogy (methods and management)
Psychology
Domestic Science and Art
Bible Study
General Science, 8th grade

The date and order of examinations in subjects printed in italics must not be changed under any circumstances. If the other subjects can not be taken on the day specified on account of conflict, they must be taken as soon thereafter as possible, on the sixth day if necessary.

No examinations shall be taken earlier than the day appointed.

In case of conflict, pupils should begin early in the half day and write on both subjects in the same half day.

It is to be understood that the examinations set for any day may be taken either in the forenoon or afternoon, except in cases in which a. m. or p. m. is designated.

II. All applications for questions, stating the subject and number of question papers desired, must be made to the high school examiner on requisition blanks at least twenty days prior to the date set for beginning the examinations. The requisition blanks will be furnished on application to the examiner. The examiner may, in his discretion, offer the examinations of the board to schools of three or more teachers, not classified but doing at least four units of high school work and giving promise, with encouragement, of doing in the near future the entire eight units required for classification. Other schools will not be entitled to take the examinations. The examiner will offer examinations in subjects named in the program of studies, page 25 of this manual and in those subjects only. See also Sec. one, page 20 of this manual.

III. The envelope containing the questions must be retained by the superintendent or principal in a safe place **until the time appointed for examination, and under no circumstances** shall the envelope be opened except in presence of the class when seated and ready for work. The precise moment of the distribution of questions must be announced to the class and observed as the examination proper begins at that time.

IV. The period of examination is three hours in all subjects and no more than **three hours** shall be allowed for an examination, and no examination shall be divided, nor shall any pupil be allowed extra time, a second trial, to take the

examination at any other time than that at which the class take it, or to copy his manuscript at any other time than within the three hours.

V. The examination shall be conducted by the superintendent or the principal teacher in the high school department, and as each pupil hands in his manuscript, the conductor of the examination shall secure from the pupil the question sheet. No one is to retain a question sheet except the superintendent and high school teachers concerned until the end of the examination week.

VI. Each candidate must be supplied with **white legal cap** paper, pen and black ink and will not be allowed to communicate with anyone except the examiner in charge during an examination; nor may he leave his seat until he has completed his work on the entire number of questions. In case of any communication the offender's paper must be thrown out.

VII. Each candidate shall write at the head of his answer paper the date (day of the month and day of the week) on which the paper is written and whether it is written in the forenoon or afternoon.

VIII. No explanation whatsoever shall be made concerning the questions (not even to explain or call attention to a typographical error), and no teacher or other person shall be allowed to criticise or inspect the work of the pupils while in progress. Each pupil is to rely solely on his own judgment as to the meaning of every question, and any effort on the part of any pupil to give or obtain aid must be followed by instant dismissal from the room.

IX. Should there be any typographical error, such as to make a question, absurd, unintelligible, or unsolvable, if students see the error, and make the necessary changes and answer the question correctly, they are to be allowed full credit in the regular manner, but if they do not see the mistake and are thus unable to answer the question, it should be left out of account entirely in figuring up the credits, and the paper graded upon the basis of credits allowed for the remainder of the questions.

X. The answers are to be written with **black ink** and not with **lead pencil**, and are to be arranged and numbered in the order of the questions. Special attention should be **given to the general order, legibility** and **neatness** as well as correctness of the work.

XI. In mathematics, **the entire operation must be given. Mere results will be marked zero.** In the translation required in the language papers, no dictionaries or vocabularies must be used.

Marking the Papers

XII. The superintendent or principal shall examine and mark in **red ink** all the answers in each subject. In case the principal is unable to read all the papers he may be assisted by any of the teachers of the high school department appointed for that purpose. **Each answer** entitled to a definite number of credits **must be marked separately** and not a mark given to the paper as a whole. The credits assigned should be reduced to a scale of one hundred and the grade entered on filing margin as "principal's mark." Papers falling below 65 per cent., or illegible or slovenly in appearance, must not be sent to the examiner.

Sending Papers to the Examiner

XIII. Papers when marked should not be rolled; but those of each writer on each subject must be folded separately with the upper part of the first page on the outside and those in each subject should be tied together with the class list, **properly filled out** and placed on the outside, so that the package will show, without being untied, the place, subject, etc. **As the amount of time spent in preparation is an element in securing credit, the data called for on these class lists and principal's certificates must be complete.** Strong rubber bands are preferable to twine or cord. The papers in all subjects should be tied together in one package, carefully wrapped and sealed, and sent by mail or express, charges prepaid, to the State High School Examiner, University, N. D. If the package is very small it may be sent by mail.

XV. The principal's certificate and the class list must be sent properly filled out and signed.

Appeal From Examiner's Markings

XVI. The appeals from the examiner's markings must be made within ten days after the receipt of the examiner's notice of results.

The Examiner's Report will be published as soon as possible after the examinations are completed.

Address,

STATE HIGH SCHOOL EXAMINER,

University, N. Dak.

(There is a post office and an express office at the University, known by the name "University.")

III. PROGRAM OF STUDIES FOR HIGH SCHOOLS

CONSTANTS FOR THE PUPIL (See Page 14)

NAME OF SUBJECTS	Year to be Persued in Four-year High Schools	Outline on Pages
English III* or IV*	3rd or 4th	27, 32
Science, One Unit		50-62
Civics, ½ Unit*	4th	48
English I, Literature ½* Grammar and Rhetoric ½*	1st	27-28
English II, Rhetoric and Comp. ½* Literature ½*	2nd	29-30
History, Adv. U. S. ½*	4th	47

CONSTANTS FOR THE SCHOOL (See Page 14)

Algebra, Elementary*	1st or 2nd	39
English III, Literature ½*, Rhetoric and Comp. ½*	3rd or 4th	31-32
English IV, Rhetoric and Comp. ½* Literature ½*	3rd or 4th	32-33
Biological Science or Agriculture, one unit		56, 72
Civics,* ½ unit	4th	48
Chemistry or Physics	3rd or 4th	50, 53
Domestic Art I,* ½ unit	1st	75
Domestic Science I,* ½ unit	1st	75
Drawing, Freehand,* one year, ½ unit	1st	78
English I*	1st	27
English II*	2nd	29
Geometry, Plane	2nd or 3rd	40
History, Adv. U. S.,* ½ unit	4th	47
History, General History I,* ½ unit and	2nd	41
History, General History II,* ½ unit or	2nd	45
History, Ancient*	1st or 2nd	47
Manual Training,† ½ or more units	1st and 2nd	74
Mechanical Drawing I, ½ unit	1st or 2nd	75
Music, Vocal,* one or two years, ½ unit	1st or 2nd	79
Physical Education		17-19

ELECTIVES

Commercial Subjects

Arithmetic, High School,* ½ unit	4th	85
Bookkeeping ½* or one unit †	1st or 2nd	80
Geography, High School,* ½ unit	3rd	81
Law, Commercial, ½ unit†	3rd or 4th	81
Penmanship and Spelling,* ½ unit	1st	80
Shorthand I †	3rd	83
Shorthand II †	4th	83
Typewriting I, ½ unit †	3rd	83, 84
Typewriting II, ½ unit †	4th	83, 84

Foreign Language

Caesar, Latin II	2nd	34
Cicero, Latin III	3rd	35
French I	3rd	35

†No examinations at any time.

*Offered for examination in March as well as in June.

French II	4th	36
German I	2nd or 3rd	37
German II	3rd or 4th	38
German III	4th	38
Latin I, Grammar	1st	33, 34
Norse I	2nd or 3rd	39
Norse II	3rd or 4th	39
Second-year Latin†	2nd	34
Vergil, Latin IV	4th	35

History and Economics

History, English,* ½ unit	3rd	46
History, Modern	2nd or 3rd	47
Political Economy, General Economics, ½ unit	3rd	49

Mathematics

Algebra, Advanced, ½ unit	3rd or 4th	40
Arithmetic, High School,* ½ unit	4th	85
Geometry, Solid, ½ unit	3rd or 4th	40
Trigonometry, Plane, ½ unit	4th	40

Miscellaneous

Common School Course	Eighth Grade	86
Bible Study, ½ unit		33
Domestic Art II, ½ unit	3rd	75
Drawing, Mechanical II, ½ unit	2nd	77
Pedagogy,* ½ unit	4th	84
Psychology,* ½ unit	4th	84
Senior Grammar,* ½ unit	4th	86

Science

Agriculture,* one unit	3rd	72
Bacteria, Yeasts and Molds, ½ unit †	2nd	70
Botany I,* ½ unit	1st or 2nd	56, 58
Botany II,* ½ unit	2nd or 3rd	56, 59
Chemistry	3rd or 4th	53
Domestic Science II, ½ unit	3rd	75
General Science	Eighth Grade	63
Geography, Physical, ½* or one unit	1st or 2nd	64
Geology, Elementary, ½ unit †	2nd or 3rd	68
Horticulture, ½ unit †	2nd	72
Physiology,* ½ unit	3rd	63
Zoology,* ½ unit	1st	56, 60
Zoology II, ½ unit	2nd	56, 62

*Offered for examination in March as well as in June.
†No examination at any time.

IV. SYNOPSIS OF SUBJECTS

ENGLISH

The courses in English have been thoroly outlined in syllabi, which aim to present the subject rather definitely. As these syllabi are available for all teachers, (address High School Examiner, whose post office is University, N. Dak.), brief synopses, giving the classics to be used, seem to be all that is necessary here.

The literature work here outlined represents the minimum that should be done. Especially should students be encouraged to do more than the required amount of outside reading. The list of selections for reading is much more extensive than formerly. It is not necessary, however, that a school should possess many copies of each of the books listed. All schools should provide as many copies as are necessary of each of the starred titles. Single copies of the others may well be placed in the school library if possible. It is recommended that the students should own the classics used for class study, thereby enabling them to accumulate the nucleus of a private library.

Credit will be given for the literature and composition work separately and examinations will therefore be offered in each half unit of work. This course contains sufficient material to meet the college entrance requirements for the years 1915 to 1919.

ENGLISH I

First half-year. The Study of Literature—(One-half Unit)

For Class Study:

Macaulay	**Horatius at the Bridge.**
Burroughs	**Sharp Eyes.**
Hawthorne	**Great Stone Face, Ambitious Guest, Great Carbuncle.**
Dickens	**Christmas Carol.**
Irving	**Sketch Book** (Rip Van Winkle, Legend of Sleepy Hollow and one or two other sketches).
Hale	**Man Without a Country.**
Lowell	**Vision of Sir Launfal.**
Lincoln	**Gettysburg Address** (memorize).
Hubbard	**Message to Garcia.**
Longfellow	**Courtship of Miles Standish.**
Whitter	**Snow-bound.**

For outside reading: Four books.

One from the following:

Scott	*Lady of the Lake.
	*Marmion.
Tennyson	*Enoch Arden, Gareth and Lynette, Lancelot and Elaine, Passing of Arthur.

One from the following:

Antin	Promised Land.
Bible,	Old Testament Stories (ed. by James R. Rutland).
Lanier,	Boys' King Arthur.
Cooper,	*Last of the Mohicans, or The Spy.
DeFoe,	*Robinson Crusoe, Part I.
Homer,	*Iliad or *Odyssey, in translation.
Parkman,	*Oregon Trail.
Porter,	Scottish Chiefs.
Riis,	Making of an American.
Stevenson,	*Treasurer Island.
Washington, B. T.,	*Up From Slavery.

Two from the following:

Aldrich,	Story of a Bad Boy.
Clemens,	Tom Sawyer.
Dickens,	Nickolas Nickleby.
Dodge,	Hans Brinker.
Eggleston,	Hoosier Schoolboy.
Franklin,	*Autobiography.
Kipling,	*Captains Courageous.
	First or Second Jungle Book.
Moores,	*Abraham Lincoln for Boys and Girls.
Poe,	*Gold Bug.
Stevenson,	*Travels with a Donkey.
Warner,	*In the Wilderness.
	*Being a Boy.
Wiggins,	*Rebecca of Sunnybrook Farm.

Note: The aim of this work should be to interest the pupil in reading, to introduce him to new authors, to arouse his enthusiasm for real books. Something in regard to the lives of the authors read may be introduced and the pupil should be encouraged to express himself by re-telling the stories or explaining why he likes them. The work should be made different fro mthat of the eighth grade; it should be maturer and more independent. An attempt should be made to get the pupil to appreciate something of the charm of style as evident in the choice of words, apt sentence structure, or good paragraph arrangement in the authors read.

Second half-year. The Study of Grammar and Practical Rhetoric—(One-half Unit)

Note: The study of the first half-year should have so convinced the pupil of the inadequacy of his own equipment that he will turn not unwillingly to the clearing up of doubtful matters in grammar and the learning of the elementary principles of rhetoric, including punctuation, capitalization, spelling of difficult words, etc. The teacher should determine what points in grammar need emphasizing and then should drill on them. The work should be practical, grammar as it is used. The common errors in speech should be taken up and the nature of the mistake fully explained. Letter writing should be practically taught and many letters written, business letters, friendly letters, invitations, acceptances, descriptive letters, narrative letters, etc. The pupil should constantly have in hand some practical creative work and be constantly handing in exercises or compositions. There should be oral composition at least one day a week in which the pupil should be held up to a reasonably high standard of speech. In connection with this work and the themes in description and narration, practical examples from current papers and magazines may well be employed.

ENGLISH II

First half-year. Continued Study of Practical Rhetoric and Composition—(One-half Unit)

Note: The work should continue that of the first year, bringing in also simple exposition, good models of which can easily be found in current periodicals. The planning of a composition and its paragraphing should be dwelt upon, the work being always made as practical and as close to life as possible. At least two themes of 150 words each per week should be required. These should be criticised and rewritten if necessary.

Second half-year. The Study of Literature—(One-half Unit)

(1) Drama.

For class study:

Two from the following:

Shakespeare,	**Julius Caesar.**
	King Lear.
	Macbeth.
	Merchant of Venice.
	Midsummer Night's Dream.

For outside reading:

One from the following:

Shakespeare.	***As You Like it.**
	***Henry V, or The Tempest.**

or **Two** from the following:

Sheridan,	**Rivals.**
Goldsmith,	**She Stoops to Conquer.**
Kennedy,	**Servant in the House.**

Note: Good oral rendering should be insisted on. Parts may be assigned from the plays studied, and the play read with as much realism as possible. The great passages should be committed to memory, and the student's ear trained to catch the rhythm.

(2) Novel.

For class study:

Eliot,	**Silas Marner.**

For outside reading:

One from the following:

Churchill,	**Crisis.**
	Richard Carvel.
Dickens,	***Tale of Two Cities.**
Hawthorne,	***House of Seven Gables.**
Jackson,	**Ramona.**
Kingsley,	**Westward Ho!**
Scott,	***Ivanhoe.**
Wallace,	***Ben-Hur.**

(3) Short Story

For class study:

Textbook, Cody, World's greatest short stories.

Reference and outside reading, Matthews, *The Short Story.

Review:

Irving,	**Rip Van Winkle,** (In Cody).
Dickens,	**Christmas Carol,** (In Cody).
Hawthorne,	**Great Stone Face,** (In Cody).
	Ambitious Guest, (In Matthews).

Study:

Maupassant,	**The Necklace,** (In Cody).
	The String, (In Cody).
Kipling,	**The Man Who Would be King,** (In Cody).
Poe,	**Gold Bug,** (In Cody).
	Fall of the House of Usher, (In Matthews).
	Descent into the Maelstrom.

For outside reading:

Six from the following:

Aldrich,	**Marjory Daw.**

Arabian Nights,	**Aladdin, or the Wonderful Lamp,** (In Cody).
Balzac,	**A Passion in the Desert,** (In Cody).
Dickens,	**A Child's Dream of a Star,** (In Cody).
Harte,	**Tennesee's Partner,** (In Matthews).
Stevenson,	**Markheim,** (In Matthews).
Stockton,	***The Lady, or the Tiger?** (In Matthews).
Thackeray,	**A Princess's Tragedy,** (In Cody).

One from the following:

Van Dyke,	***Blue Flower.**
	Ruling Passion.
Kipling,	***Day's Work.**

Two short stories from current literature, selections to be approved by the teacher.

Note: The theory of the short story should be studied and the strong and weak points of those read should be presented.

ENGLISH III

First half-year. Continued Study of Literature—(One-half Unit)

(1) Poetry, Narrative, Epic and Lyric.

For class study, **Four** from the following:

Arnold,	**Sohrab and Rustum.**
Coleridge,	**Rime of the Ancient Mariner.**
Milton,	**Minor Poems, or Paradise Lost,** Bks. I-III.
Pope,	**Rape of the Lock.**
Scott,	**Lay of the Last Minstrel.**
Tennyson,	**Idylls of the King,** selected (Riv. Lit. Series No. 233).

Study and read selections of ballads and lyrics from the following authors:

Shakespeare, Milton, Herrick, Gray, Blake, Burns, Wordsworth, Shelley, Keats, Scott, Tennyson, Browning, Kipling, Longfellow, Poe, Whittier, Bryant, Lowell, Emerson, Whitman, Lanier, Field, Harte, Riley, Foley and other contemporary poets.

Teachers should make their own selections from available material. Among the best collections are:

*Palgrave,	**Golden Treasury.**
*Seward,	**Narrative and Lyric Poems.**
Baldwin & Paul,	**English Poems.**

Memorize numerous selections, at least one from each leading author.

Note: The characteristics of the various kinds of poetry should be clearly distinguished. The basic principles of lyric poetry should be studied and many poems read and discussed. Occasional papers should be written, some of which may be interpretations of poems read.

(2) Oration.

For class study:

Lincoln,	Gettysburg Address, (Review).
	Inaugurals.
	Cooper Union Speech.
Washington,	Farwell Address.
Webster,	First Bunker Hill Oration.
Burke,	Speech on Conciliation.

For outside reading: Two from the following:

Hayne,	Speech on Foote's Resolution.
Lincoln,	Speech in Independence Hall, and Last Public Address.
Macaulay,	Speech on Copyright.
Webster,	Second Bunker Hill Oration.
	Reply to Hayne.

Also oratorical selections from the library and from contemporary speakers, to be chosen by the teacher.

Note: A number of selections should be memorized and declaimed, and the student trained to recognize good style. A reasonable sprinkling of written themes may well be required, but the chief emphasis is on the oral rendering.

Second Half-year. Study of Rhetoric and Composition, including Argumentation—(One-half Unit)

Note: Class room debating should be a prominent feature of this work, also the briefing and writing of argumentative themes, several of which should be written, and if necessary, rewritten. As soon as one piece of work is completed, another should be taken up, making the effort of the pupil continuous and reasonably exacting.

ENGLISH IV.

First Half-year. Continued Study of Rhetoric and Composition—(One-half Unit)

Note: The whole subject should be reviewed and the student's weaknesses corrected. Many papers, including all types should be prepared; oral composition should be kept up based on current topics. In connection with this work some good weekly paper, such as the **Outlook, Independent** or **Literary Digest** might well be used.

Second Half-year. A Brief Survey of the History of English and American Literature—(One-half Unit)

Note: Some brief textbook may well be used here as the basis of the historical study. Historical and critical essays should be prepared. Some of the classics previously read should be recalled and various masterpieces which have not been read in previous years, should be studied or read to fill in the gaps. Especial attention may well be given to the essay and a number of biographical essays used to furnish lives of authors as they are taken up. The following are suggested:

For class study:

Carlyle,	**Burns.**
Macaulay,	**Johnson.**

For outside reading:

Two or more from the following:

Addison,	*DeCoverly Papers.
Briggs,	School, College and Character.
Emerson,	Representative Men.
	*American Scholar.
Holmes,	Autocrat of the Breakfast Table.
Howells,	My Literary Friends and Acquaintances.
Lamb,	*Essays of Elia (selected).
Lowell,	*My Garden Acquaintance, etc. (Riv. Lit. Ser. No. 169).
Macaulay,	*Milton.
	*Goldsmith.
Stevenson,	*Inland Voyage.
Thackeray,	English Humorists.
Van Dyke,	*Little Rivers.
	Fisherman's Luck.
Warner,	*My Summer in a Garden.

BIBLE STUDY

One-half Unit

This half-unit of credit is allowed on passing state examination and without regard to how preparation was made. A syllabus on this subject may be had by addressing Mr. Walter Snow, Fargo, N. D.

LATIN

Pupils should be held strictly to the use of clear idiomatic English in their translations, though they should be led from

the start to notice carefully the Latin order of words and to comprehend the thought in that order.

In the reading of the Latin text the teacher should see not only that each word is correctly pronounced but also that the words are properly grouped. He should strive to teach intelligent, expressive reading. The Roman method of pronunciation should be used.

LATIN I

One Unit

Latin Grammar and Easy Latin Prose

As the work of this year is fundamental, it is of the utmost importance that it be accurate and thorough. The aim should be the acquisition of a vocabulary of a few hundred words, a thorough mastery of the regular and most common irregular forms, and a firm grasp of the more usual constructions. To accomplish this, contant review, oral and written, is necessary. Therefore, when the declensions, the conjugations and comparisons have been studied, there should be frequent practice in the declensions of nouns, pronouns and adjectives, in the conjugation of verbs, and in the comparison of adjectives and adverbs. Much of this can be done in connection with the work in composition, the pupil being asked to write a sentence on the board and to decline a noun and pronoun and give a synopsis of a verb in the sentence. All long vowels should be marked in all written work. After the first two or three lessons, translation, oral and written, from Latin into English, and from English into Latin should form an important part of every recitation. Nor should the teacher restrict himself to the sentences in the text book; he should compose a large number himself, making repeated use of those words and constructions which it is most necessary for pupils to know. Word formation should receive some attention .

LATIN II

One Unit

The reading matted of this year may consist entirely of Caesar's Commentaries, or a somewhat freer and wider course may be given. The courses are as follows:

(a) "Caesar." The first four books of Caesar's Gallic War.

(b) Selections from Caesar equivalent in amount to two books, and selections from Viri Romae and Nepos and, perhaps, other prose equivalent to two more books.

With either reading course the following suggestions should be carried out:

1. Reading of Latin aloud, and translations into clear, idiomatic English.

2. The syntactical relation of each word should be understood, and the thought fully comprehended; principal parts of all verbs memorized; frequent practice in the declension of nouns, pronouns and adjectives in the conjugation of verbs, and in the comparison of adjectives and verbs. This grammatical work should receive great emphasis.

3. The life of Caesar; the geography of the country; the organization of the Roman army, and the Roman art of war; all other subjects necessary for an understanding of the text read.

4. A careful, thoro review of the forms and word-formation should be made, and a systematic study of syntax should be begun.

5. Latin Composition at least once a week. Sight reading. Memorizing of noteworthy passages.

LATIN III

One Unit

Cicero's orations: In Catilinam. De Imperio Pompei, and Pro Archia, six orations in all.

1, 2 and 5 as in the second year.

3. The life of Cicero; the history of his time; Roman oratory; Roman government; all other subjects necessary for an understanding of the text read.

4. The systematic study of syntax continued.

6. A careful study of the structure of each oration, but especially of the De Imperio Pompei.

LATIN IV

One Unit

The first six books of Virgil's Aeneid.

1, 2 and 5 as in the second year.

3. The life of Vergil; all subjects of a geographical, archaeological, mythological or other nature necessary for an understanding of the text read.

4. A study of the poetic forms and constructions met in the text.

6. A study of the structure of the Dactylic Hexameter and careful attention to the correct reading of it.

FRENCH I

The thing of chief importance in the first year of the teaching of French is to lay all possible stress on the fundamentals. Because many French words resemble in appearance English words (which are usually not equivalent) and because the

word order is partially similar, there is a deceptive easiness about the study that leads to carelessness on the part of both teacher and pupil. This results in many misunderstandings and a basic knowledge is often not secured. **Clarity** and **precision** are two of the chief characteristics of the language and if it is not studied with full appreciation of this both the practical and the cultural values suffer.

The objects to strive for in the first year are: (1) an unobjectionable pronunciation; (2) a thorough knowledge of the forms of the language, including twenty-five of the commonest irregular verbs; (3) a knowledge of the general elementary points of syntax; (4) the thorough mastery of about 1500 words of vocabulary and common idioms; (5) the ability to translate at sight simple French of the grade found in the average reader; (6) the ability to comprehend short questions in French and form short answers to them.

The basis of all successful work is the pronunciation and there should be no haste in outlining it clearly, **describing how the sounds are formed** as well as pronouncing them for imitation. The beginning book should be one that uses some form of phonetic transcription, preferably that of the International Phonetic Association—such a book as either of those by **Fraser & Squair** (D. C. Heath) or Thieme & Effinger (Macmillan). If the teacher feels able to attempt the modern Reform Method now widely used abroad a choice may be made of the **Walter-Ballard** (Scribners). This is especially good in small classes. All new words must be carefully pronounced by the teacher and care taken to see that the pupil gets a correct notion of the sounds the first time. Do not be afraid to correct unceasingly. Make frequent use of dictation exercises, using the lessons as a basis. Drill carefully on the verbs, saving time by using a verb blank (one can be secured from the University Bookstore, University, N. D.) Be practical and translate early, questioning as far as possible in French, using the text as a basis. Correct carefully all exercises and insist on corrected work being re-written. Memorize the **Marseillaise** (two or three stanzas) and sing it in class. Use the reading material to suggest as far as possible facts in French, history, life, commerce, industry, etc. A reader such as Talbot: **Le Francais et sa Patrie** (Sanborn) is of great help in this work.

FRENCH II

One Unit

Review the fundamental features of the first year, using some such book as Trois Semaines en France (Oxford University Press, New York). This exercise should come once a

week throughout the year. It may be supplemented by composition work based on the text. Re-emphasize constantly the pronunciation. The reading should be copious and fairly easy, although an increase in difficulty over that of the first year. Such texts as Merimee's Colomba, Brunot's Le Tour de France, Malot's Sans Famille, About's La Mere de la Marquise, Halevy's L'Abbe Constantin, Labiche, Le Voyage de M. Perrichon may be chosen and toward the end of the year an excellent choice is Maupassant, Huit Contes Choisis (D. C. Heath). In Health's catalogue will be found an excellent graded list of texts for different degrees of advancement. Memorization of short French poems such as Nadaud's Carcassonne, Hugo's Le Tombe a la Rose, etc. (Note: Schools offering French should have the following equipment: (1) International Pronouncing French Dictionary (Hinds, Noble and Eldredge); Le Petit Larousse Illustre (G. E. Stechert, New York); (3) Map of Europe (Rand-McNally's Chicago); (4) A Map of France, St. Paul Book and Stationery Co., St. Paul, Minn.); a Plan of Paris (Nouveau Paris Monumental et Environs de Paris, (Paris, Garnier Freres, No. 6, Rue Des Saints Peres); Dowden's History of French Literature Appletons); Adams, A Short History of the French People; Taine, the Origins of Contemporary France).

Teachers may well add to their personal library the following: Report of the Committee of Twelve, (D. C. Health); Karl Breul, The Teaching of Modern Foreign Languages (G. E. Stechert, New York); Jespersen, How to Teach a Modern Foreign Language (G. E. Stechert, New York). Regular reading and investigation should have a definite part in the work of every teacher. The standard of modern language teaching is steadily improving.

(For further assistance and suggestion, address the Department of Romance Languages, University of North Dakota, University, N. Dak.)

GERMAN I

One Unit

The first few weeks of the study of German are critical. Every effort should therefore be made that the students acquire a perfect pronounciation. Drill must be the slogan—ceaseless and untiring drill, individual and in concert. Explain the physiology of sound production. Use phonetic transcription to keep the teacher's and the pupils' pronounciation up to grade. Assign to pupils no home study without having previously prepared the work thoroly in the class. Insist that the vocabulary be mastered. Insist that the points in the

grammar are understood and that the principles can be applied, not only in paradigms but in complete sentences,—in other words, teach lebendige Grammatik. Use dictation exercises, lasting, at the most, ten minutes, at least one each week. Sing German songs. Teach pupils to read the German script, even if they are not required to write it. It is part of their German equipment. It does its part to create Sprachgefuhl. Do not teach only the German language, but teach also something of the Germans as a great modern nation—economically, politically, industrially, educationally, etc. For this purpose select some simple reader which deals with German life, rather than some of the many pathetic tales that are frequently read. See to it that readers and grammar are thoroly modern and up to date. Memorize: O Tannenbaum; Heine's Du bist wie eine Blume, and Die Lorelei; Goethe's Das Heidenrœslein. Master the essentials of grammar and read one hundred pages of graded prose. Make German the main medium of expression in the class room. Remember the words of Gothe: Das Was bedenke, mehr bedenke Wie.

GERMAN II

One Unit

Review the Grammar thoroly. Read much aloud. Translate only the difficult parts of the lessons. Let no faulty pronounciation pass uncensured. Read at least one text that deals with German life. (Most of the book companies have recently gotten out some excellent texts of this kind). It is essential that our students should have a correct notion of the Germans of today. Give composition work once a week. Give dictation exercises of fifteen minutes once a week. Have oral reproduction of short anecdotes and short stories. Memorize: Die Wacht am Rhein; Eichendorff's Das zerbrochene Ringein; Goethe's Der Erlkœnig; Uhland's Das Schlosz am Meer. Sing German songs. Read two hundred pages of graded prose.

Aside from the text on German life, selection may be made from such text as: Seidel's Aus goldenen Tagen; Frommel's Mit Rænzel und Wanderstab; Wildenbruch's Das edle Blut; Raabe's Else von der Tanne; Hauff's Das kalte Herz.

GERMAN III

One Unit

In this course, the following are read: Riehl's der Fluch der Schoenheit Fouque's Undine, Baumbach's der Schwiegersohn, Freytag's die Journalisten, Schiller's Wilhelm Tell, a good historical selection, and a few selected ballads and lyrics. Much work in oral and written paraphrases, abstracts, or free repro-

ductions from memory of selected portions of matter read; also such grammatical drill as the class may need.

NORSE I AND II

These courses are to be equivalent to the courses in German I and II or French I and II in the amount of work required, in the credit allowed, and in their demand upon the effort of the pupil.

For details regarding the content of these courses, apply to the Department of Scandinavian Languages of the University of North Dakota. The post office address is University, N. D.

ELEMENTARY ALGEBRA

One Unit

At the beginning there should be a short treatment of this subject in such a manner as to make its relation to arithmetic as close as possible. Throughout the course it should be shown that the definitions and principles of arithmetic with some extension of meaning hold true in algebra. At the outset the pupil should learn that in algebra he is dealing chiefly with number and that each letter or combination of letters (algebraic expression) represents a number. The first problems should be such as may be solved as an exercise in either arithmetic or algebra and should be solved both ways. Problems that may be solved by the use of linear, or simple, equations should be placed early in the course.

After the above preliminaries are completed, the following topics should be treated. The order in which many of them are taken up is not important: Positive and negative numbers. Axioms. Addition. Subtraction. Signs of aggregation, Multiplication. Division. Special products. Factors. Highest common factor. Lowest common multiple. Fractions in algebra. Fractional equations. Simultaneous equations of two and three unknown numbers. Involution. Evolution. The simpler work in negative, literal, fractional and zero exponents. The simpler work in radicals, and radical equations. Graphic solutions. Pure quardratics. The simpler work in affected quardratics.—solutions by completing the square and by factoring. Problems in simultaneous quadratics—two unknowns. The simpler work in ratio and proportion.

The following topics are not included in this course: Highest common factor by continued division. Simultaneous equations involving four or more unknown numbers. Indeterminate equations. Inequalities. The factor theorem. The more involved work in radicals, quadratics and ratio and pro-

portion. The theory of exponents. Imaginary numbers. Equations in the quadratic form. Theory of the quadratic equation. Cube root.

ADVANCED ALGEBRA

One-half Unit

This course includes the following topics: General principles of the fundamental processes. Signs of aggregation. Equations, Factoring. The factor theorem. Highest common factor, including the process by continued division. Algebraic fractions. Simultaneous equations, Graphs. Cube root. Inequalities. Indeterminate equations. Theory of exponents. Radical equations. Imaginary numbers. Quadratics. Ratio, proportion and variation. Series. Binominal theorem. Logarithms.

PLANE GEOMETRY

One Unit

As presented in the ordinary text books.

Care should be taken that the pupil gains not merely a superficial readiness in using the form of geometric proof, but also an insight into the underlying principles of the subject which will enable him to apply his knowledge rightly.

Varied examples involving numerical computation should be given and occasional brief practice in drawing to scale will perhaps be found helpful.

Effort should be made through abundant work in original exercises and otherwise to develop in the pupil a prompt and independent facility in geometrical reasoning and proof, in constructions and in computation of problems involving mensuration.

SOLID GEOMETRY

One-half Unit

The course as given in the usual text books in solid geometry.

The suggestions given above for plane geometry may also be observed in teaching this subject.

PLANE TRIGNOMETRY

One-half Unit

The definitions and relations of the six trignometric functions as ratios; the use of tables and the elementary theory

of logarithms; the solution of right and oblique triangles and considerable practice therein; the proof of important formulas for the solution of triangles, for the ratios of the sums and difference of angles and for other trigonometric transformations; some practice in such trignometric transformations and verifications of identities as are given in the ordinary text books.

HISTORY

General history as a one-year course, and ancient and modern history as a two-year course, are in part duplicate subjects; therefore, a pupil who receives credit in general history shall not receive credit in ancient or modern history, and vice versa. Pupils should pursue general history or both ancient and modern history.

GENERAL HISTORY I

First Semester

One-half Unit

General history is a full-year course beginning with the earliest civilization in the East and extending to the present. The study will cover the same ground as ancient and modern history, but less intensively. The work is divided into two semesters and one-half unit credit is given for each semester's work.

The first half of the year's study begins with the earliest civilization and extends to about 1300 A. D. The work should begin with a brief sketch of Egypt, the Mesopotamia Valley, and the kindred peoples, then the larger portion of time is given to a study of Greece and Rome. Some texts devote several preliminary pages to the races of mankind; where this is the case the text should be followed and the races and families fixed in mind.

The following topics should be treated: The far East, India and China; the races, dynasties, religion, education—literature, writing, and the like.

Egypt; the physical features and climate, the dynasties, the people, their religion, social life, and industries, their monuments and contributions to civilization. Some up-to-date treatise should be consulted on these topics.

The Semitic people:

a. Early Babylon. The development and union under industrial development, conquests, and decay.

b. Assyria. Contrast with Babylonia, the people, religion, institutions, and industries. Note also the warlike attitude of

the two. Assyria became the first world power. Note any scientific contributions to civilization. Make a careful study of the development of the City State, its origin and development into a nation.

c. **Later Babylonia.** Medes, Persians, Syrians, Hebrews, and Lydians. The international relations are complicated. Babylon is recognized as the greatest kingdom.

d. **The Hebrews.** Their early history should be learned: the longing for a land or home free from external influences. A study of their laws and government might profitably be made. Note also their domestic life, religion, and relation to other nations. They developed no art or science; why? Their contribution to civilization was a religion.

e. **The Phoenicians.** The position of their country led to a new industry—commerce. Find some historical association with their capital cities, Tyre, Sidon, also the Cedars of Lebanon. Their greatest work and contribution was the colonization of new territories and the development of an alphabet.

In the above outline of study, follow carefully the civilizing influences; note the institutions of art, culture, and the various industries. It should be observed that the Semitic people have contributed to the world their religions, and the contribution of the Hebrews—the Christian religion as set forth in the Bible—is the crowning work of all the races.

The Persians. Note their race, government, rapid development till they have absorbed Asia Minor. Study the plan of expansion, of the building of roads, houses, etc. An important feature in their life is their religion, due to their contact with Greece. Their militray campaigns are of small moment, except perhaps, against Greece.

Grecian History

The Beginnings of Greece. The Greek people, the different tribes, their early language and traditions. The land, its significance. The legendary periods; the Homeric and Mycenian ages; the culture of these periods.

The Greek City State, 700-500 B. C. The political growth and expansion thru sending out colonies. The typical city states—Athens and Sparta. The growth of Athens as a democracy, a monarchy, an olagarchy, a tyranny-democracy. The growth of Sparta, a monarchy. The social and economic conditions in the two cities. The Graeco-Persian wars, cause and results (details not necessary).

Struggle for Supremacy in Greece. The Athenian supremacy; her naval policy—the Delian League. Pericles, his office, work, and influence. **Spartan supremacy,** cause result. **Theban**

supremacy. Relation of states, attitude toward democracy. **Macedonian supremacy.** Political life in Greece, Leaders.

Union of Greece and the Orient. The Conquest of Alexander, his empire. Spread of Greek culture and its influence. Division of his kingdom.

Greek Architecture, Painting, and Sculpture. Their development and influence upon the world. Literature, epic and lyric poetry, their development. The drama and its development. History, oratory, philosophy, the different schools and leaders: The underlying principles of each Science, the Greek contribution to civilization

Hellenic and Hellenistic Culture. The social life of the people. Spread to the East. **The Achaean League,** its origin, constiution, growth, conflict with Sparta. Final decline.

Little or no emphasis should be placed upon the following topics: The domestic strife and civil wars, except to note that Greece could never unite and hence was destined to be absorbed by a greater power; the foreign wars and international affairs, except as other nations came under the influence of Greek culture; the Legendary and pre-historic periods, except as introductory; the numerous gods, except as influencing their social life.

Roman History

The land: geographical unity, position, and extent. The people: mingled races: Italians, Greeks, Gauls, Etruscans, etc.

Traditional Origin: how founded, growth, etc. Growth of city of Rome. Patricians and Plebians. **Units:** Family, clans and gens, tribes, city state, nation, and empire.

The Republic. Development of a constitution, class struggle, the patricians, plebian assembly, the political and social fusion. **Unification of Italy** under Roman rule. **Subjects:** Latin colonies, praefectures, allies. **Bonds of union,** patriotism, language, government. Punic Wars: occasion, Carthage a growing power, final struggle, Scipio and Hannibal, results. Conquest of East and West Mediterranean lands. **World Empire—Evils:** luxury, gladiatorial games, etc. Greek culture and wealth; political, economic, and social results.

Transition from Republic to Empire. The Gracchi, attempts at reform, Agrarian laws, economic and political reform, land laws.

Military Rule. War with Jugurtha (senate corrupted). The Cimbri, and Teutons. Marius and Sulla. The social war, massacres and proscriptions. (Details not necessary. Observe the patriotism shown).

Growth of Imperialism. Pompey, Caesar and Crassus, the triumvirate, rise of Caesar, fall of Pompey. Caesar's constructive work, reform in provinces, clemency, land laws, character of Caesar.

The Empire. Augustus: Character, rule, world peace, results. The Julians' Character of rule, stability of government, development of art, science, culture, and literature: their worth. The Flavians. The Antonines. **A World Empire.** The later Government: municipal, provincial. ..**The Army,** its organization provincial and local.

Education. Universities, grammar schools, and elementary schools. **Religion,** pagan and Christian; persecutions under Nero, Diocletian, and Marcus Aurelius.

The Christian Church. Its organization, growth under Constantine. The division of the kingdom west and east. Struggle with the barbarians.

The Dissolution of the Roman Empire. The Teutonic invasions: East Goths, West Goths, their demands, results; the Huns; the Vandals; the Franks, Clovis and his successors. The fusion of Teuton and Roman culture. The Mohammedan peril; beginning, spread, check at Tours.

The Papacy. Development, temporal powers. **The Franks and the popes. Charles Martel, Pippin, Charlemagne's Kingdom,** expasion, consolidation. Social and political conditions. Charlemagne crowned 800 A. D. Charlemagne's successors. The Treaty of Verdum, 843; division of the kingdom. The new barbarian attack—Slavs, Norsemen, Huns—results. Feudalism, causes, extent, elements; land tenure and military service. Results in Western Europe, commerce, literature, social life.

France from the Treaty of Verdun to the twelfth century: the organization and development of the kingdom.

Germany, development, growth, rulers. The **Holy Roman Empire,** origin, extent, result. The struggle between the emperors and the pope. Growing jealousy. Hildebrand; Innocent III.; Henry IV., etc.

The Crusades. Conditions in East before crusades. The Mohammedans, their attitude. The Turks, opposed to the Pilgrims. Results of crusades—developed commerce, universities, trade. The rise of towns. The guilds—merchants —trade. The new monarchies, centralized power. England, France, Spain, Germany, Scandinavia, Switzerland, Netherlands, their struggle, rapid growth, and relation to foreign forces. Note their growth after the crusades.

GENERAL HISTORY II

Second Semester

One-half Unit

In the study of modern history care should be taken to follow institutional and national development, in which the germs of our own institutions, government, and society may be found. Place special emphasis upon the following topics:

The Renaissance. The nature and development of new-old ideas. The new learning, medicine, art, philosophy, literature. Some leaders of the movement: Dante, Petrarch, and others.

The Protestant Reformation. Luther, his life and work, his precursors. Counter Reformation in the Catholic Church; results. A century of religious wars, Protestant and Catholic.

England in the Seventeenth Century. Civil wars, causes and results. The Tudors, character, work, development, etc. The Stuarts, idea of government, religion. Civil war and the commonwealth; Cromwell and the Puritans; the Restoration; Revolution; a constitutional monarchy.

General European Development. Louis XIV. of France. Leadership of France. Social and economic conditions. The extravagant court. **Russia:** Peter the Great; expansion; introduction of Western ideas. **Prussia:** A military power; expansion and influence over Europe. **England:** expansion and industrial development; leaders and inventions.

The French Revolution. Existing conditions before. Constitutional monarchy; Republic, Reign of Terror; the Directory; the Consulate and Empire, Napoleon and his regime: reaction, Congress at Vienna, rearrangement of territory, etc.

France since 1815. The Divine Monarchy to 1830. Constitutional Monarchy, 1848; Republic, 1842-52; Empire, 1870; Republic.

Central Europe since 1848.... General revolution of 1848; cause. Spread of democracy. Unification of Italy; her leaders; result. Unification of Germany; leaders; circumstances. Austria-Hungary; struggles and union.

Growth of Small States in West. Spain, decline in power. Portugal, changing government. Holland, commerce, rival of England, Belgium, government and development. Switzerland, origin and growth. The Scandnavian Kingdoms—Norway, Sweden, Denmark,—government, industries, people.

England's Later Development. Political reforms; legislative and social reforms; union with Ireland and Scotland. The Irish question. Her colonial system and colonies. Constitutional development.

Expansion into Africa and Asia. The partition of Africa. The Boer War. The awakening of the East. The modern problems. Other topics of note to dwell upon are the Magna Charta, the discovery of America, the relation of Europe to the Colonies and to the United States, and the like.

The conditions in Europe, political, social, religious, military and commercial, that led to the great European war, that began in August, 1914.

Little stress should be laid upon wars and battles, campaigns and domestic strife, except where a national existence is at stake—as in French Revolution. Even then the details are not necessary. Individuals need not be studied except in rare instances. The learning of the rulers of each country is unnecessary. Know something of the great rulers, however. The same holds true with dates. Some eighty or more dates should be known as landmarks.

REFERENCE AND SUPPLEMENTARY BOOKS

Ancient Period:

1. Herodotus; (For Egypt, Babylon, Persia, and Early Greece).
2. Bulfinch; "Age of Fable or Beauties of Mythology."
3. Abbott, Jacob; Biographies of Alexander, Hamilton, and Caesar.
4. Church; "Story of the Odyssey" and "Story of the "Iliad".
5. Gulick; "Life of the Ancient Greeks."
6. "Trial and Death of Socrates" (Macmillan, Publishers).

Mediaeval Period and Modern Period:

1. Symonds, J. A.; "A short History of the Renaissance in Italy."
2. Tarbell, Ida; "Life of Napoleon and the Empress Josephine."
3. Freyton, Gustav; "Martin Luther."
4. Green; "A short History of the English people."
5. Henderson, E. A.; "Short History of Germany."
6. Macaulay, T. B.; "Frederick the Great."
7. Molley, J. L.; Peter the Great.
8. Froude; "English Seamen in the Sixteenth Century."

See also bibliographies in various textbooks.

ENGLISH HISTORY

One-half Unit

The effect of the geography of England upon its history; coming of the Romans, Angles, Saxons and Normans, and England's debt to each; Alfred the Great; development of

English political institutions which were later transferred to the Colonies in America and so passed on to us; Renaissance and Reformation; Age of Queen Elizabeth, The Great Rebellion, Oliver Cromwell and the Commonwealth; Foundation of the British Empire; the industrial, American and French Revolutions; social reform.

ANCIENT HISTORY

One Unit

This full year course in ancient history should be much more comprehensive than that contemplated for the first half of the course in general history. It should begin with a brief sketch of the oriental nations in order to show how our civilization began in the East, and how these people affected the larger nations of Europe. The Greek history should be more carefully studied. The principal emphasis should be laid first, upon the making of the two leading states of Greece—Sparta and Athens; second, upon the achievements of the Greeks outside their own narrow land, as seen in their great colonizing movements, their wars with Persia and the effort of Athens to build up a world empire; and third, upon the conquests of Alexander and the period that followed in which Greek ideas dominated the whole eastern world.

The Roman history should be studied with a view to bring out the dominant elements in the character of the people, their party strife in the evolution of their constitution, the great period of territorial growth and conquest, and last and most important of all, the unification of the world by the Roman roads and bridges, the Roman legions and the Roman law.

The era of the great migrations; the rise of the Frankish Kingdom; Charlemagne. To 800 A. D.

MODERN HISTORY

One Unit

From 800 A. D. to the present time, this should be a much more comprehensive course in European history than that contemplated for the latter half of the course in General History. A book of 500 to 700 pages should be used as a text and it should be amply supplemented.

ADVANCED UNITED STATES HISTORY

One-half Unit

For a complete treatment of this subject please see the syllabus compiled by the special committee. This syllabus

and a syllabus of a half unit in civil government, compiled by another special committee, may be had by addressing the Examiner, University, N. D., and enclosing 20 cents per copy. The two syllabi have been printed and bound in a single volume and the stock is kept at the examiner's office.

CIVIL GOVERNMENT

One-half Unit

Syllabus:—The State Board of Education has published a syllabus giving a detailed outline of the work to be covered. Please consult this syllabus.* A general statement of the work is as follows:—

1. Aim.—The aim of this course is two-fold: (1) to stimulate the pupil's interest in government activities; (2) to impart information concerning these activities. The ultimate results of this course, if properly taught, will be the creation of civic intelligence, the application of this civic intelligence to the problems of community welfare, and the assumption by the young citizen of his proper responsibility for understanding difficulties, locating defects, and aiding in the administration of our government.

2. Methods Suggested.—(1) Text. (2) Collateral. The text book must form the backbone of the course. Select a proper text, dealing with both our state and nation, and have the pupil master it thoroly. The collateral work is also very important. The following lines of collateral work are suggested: Library readings and reports on assigned topics; debates; current-events discussion once a week; visit to local institutions; visit to local meetings, such as town meetings, city council meeting, county commissioners meeting, sesson of court, etc.; a classified collection (in form of a Scrap Book or some similar permanent form) of printed matter and pictures pertaining to civil government. One newspaper or magazine dealing with good government, should be taken by the school. Devote about half of the time to the study of national government, and half to the study of state and local government. The study of national government should precede the study of state and local government, since the federal government is the general type followed by the state, and, to a certain extent, by some divisions of local government. Reading References.—

*Address: Examiner,University, N. Dak., and enclose 20 cents per copy.

A. On North Dakota:

1. Boyle. Government of North Dakota, American Book Company. This book covers both state and nation, and is designed especially for North Dakota high schools.
2. North Dakota Blue Book. Issued biennally by the Secretary of State, Bismarck. This is a good reference book to use with the above text.

B. General work on civil government. The following six books constitute a model "Ten Dollar Library in Civics," and as such they are worthy of a place in the high school library.

1, 2. Bryce, The American Commonwealth, 2 vols., 1910 edition. Macmillan.
3. Hart, Actual Government. Longmans.
4. Harrison. This Country of Ours. Scribners.
5. Beard. Readings in American Government. Macmillan.
6. Willoughby. Rights and Duties of American Citizenship. American Book Company.

C. Newspapers or Magazines:

1. Among the general periodicals, these four are recommended:—
   Outlook, New York, $3.00.
   Independent, New York, $3.00.
   Survey, New York, $3.00.
   Review of Reviews, $3.00.
2. Among the special periodicals, the following two are recommended:
   Annals of the American Academy of Political and Social Science, Philadelphia, $5.00.
   National Municipal Review, Philadelphia, $5.00.

POLITICAL ECONOMY

One-half Unit

The objects of this course are two-fold:—(1) It aims to create and stimulate in the pupil an intelligent interest in the economic life of his immediate neighborhood, and his country, state and nation. This is essential, since economic or material prosperity underlies any advance in civilization. (2) It aims to give the pupil the mastery of a few sound economic principles. The larger part of the time should be devoted to a mastery of underlying economic principles which are now accepted as axiomatic. Great care should be exercised in the study of economic questions. The purpose of the course is to offer sound principles illustrated by concrete examples.

This course should begin with a survey of the industrial stages through which civilized society has passed. This

should be followed by some consideration of the industrial history of the United States. The greater portion of the work on the course should be put on: Consumption of wealth; production of wealth; definition and factors; exchange, money, banking and credit, international trade, tariff, distribution of wealth, rent, interest, profit, wages, review of fundamental concepts, namely:—wealth, capital, value, utility. If time permits, some economic problems, such as public finance and socialism, may be studied.

A good text should be chosen and mastered. Collateral work sufficient to illustrate all the principles of the text clearly, should be employed. This can be found in part in the free government publications mentioned below, in part by observing the economic life of the community and reading the public press.

Reference Library:—

1. Ely, Outlines of Economics.
2. Adam Smith, Wealth and Nations.
3. McVey, Modern Industrialism.
4. White, Money and Banking.
5. Moody, The Truth About the Trusts.
6. Ripley, Trusts, Pools and Corporations.
7. Adams and Sumner, Labor Problems.
8. Taussig, Tariff History of the United States.
9. Coman, Industrial History of the United States.
10. Dewey, Financial History of the United States.
11. Johnson, American Railway Transportation.
12. The World Almanac.
13. The American Yearbook.

Free Publications of the United States Government:

1. Statistical Abstract of the United States. Issued annually by the Department of Commerce and Labor, Washington, D. C.
2. Bulletin of Bureau of Labor. Published at irregular intervals.
3. Annual Reports, Bureau of Labor.
4. Special Reports, Bureau of Labor.
5. Annual and Special Reports, Commissioner of Corporations. Good material on the "Trust question."
6. Reports on Good Roads. Division of Good Roads, Department of Agriculture.

PHYSICS

One Unit

The study of physics in the high school should be a study in "natural philosophy" rather than a course in applied ma-

thematics. It is a difficult matter for many students to understand the language of mathematics, even in its simplest forms, but all can appreciate and reason about the wonderful phenomena usually studied in the subjects of physics. Often times the zealous teacher gives a course much too technical, forgetting that the mathematical relations involved are always carefully studied in college in courses of study needing such preparation. The high school course is one to develop the appreciation of phenomena rather than the ability to apply the theory in practical problems.

The expression of physical facts in formulae is, in general, not a help to the understanding of the student unless a careful study is made of the application of the formulae. In as much as the opportunity for such study in the high school course is quite limited, it is recommended that the teacher be very careful in the selection of such formulae and in the assignment of problems involving their use. The teacher has an ever present problem in the selection of the work and the accompanying outlines is prepared to assist in simplifying this problem.

Minimum Requirements

1. The course in physics shall consist of at least 216 periods of forty minutes (in the clear) each of assigned work (i. e., six periods per week for 36 weeks.)

2. The work shall consist of three closely related parts, viz., class work, illustrated experiments in the class room, and laboratory work.

3. The class work shall include the study of at least one standard text.

The required units are, foot, inch, centimeter, meter, kilometer, second, pound (weight), foot-pound, horse-power, gram, gram-weight, gram-centimeter, kilogram, caloire, ampere, volt, ohm, watt, kilowatt.

One of the most important features of the text book study should be the discussion of practical applications of the various principles studied. The applications in agriculture, in manufacture, in commerce, in construction, in engineering, and in the various conveniences and necessities of life, should be continuously kept in mind. In this connection the teacher will find a book entitled "Physics of Agriculture," by F. H. King, to be a very helpful work.

The accompanying partial list of such applications will be suggestive and will indicate what is expected:

Uses of guy wires, influence of weight of draft horses.

Effect upon hauling of size of wheel, of condition of road, of steep grades.

Atmospheric pressure and pumping, breathing, milking machines and soil breathing.

Balloon.

Laundry drier, cream separator, steam engine governor, banking of railway curves, centrifuge.

Capillary action in lampwick, sponge, in the soil, and in plants.

Levers; whippletree, platform scales, two, three and four-horse evener, bones of the body, claw hammer, scissors, crowbar.

Law of machines, windlass, bicycle, treadmill, use of belting, gears, capstan, horse power sweep.

Recoil of guns.

Wedge, jack screw, press, bench vise, plow.

Hydrometer, lactometer.

Osmose with plant and animal membranes.

Pneumatic tire.

Lubrication, ball bearing, "hot box."

Methods of heating and ventilating buildings.

Heat of vaporization; cooling effect of perspiration, of sprinkled floors, of evaporating liquids. Ammonia ice plant.

Use of non-conductors of heat in tea pot handles, pokers, flatirons, etc.

Clothing—transference of heat.

Water and air cooling of gas engines, construction of gas engine radiators.

Specific heat, hot water bag, foot warmers.

Heat of fusion, ice as a refrigerating agent, ice bag, etc.

Disadvantage of green wood for burning.

Expansion of rails, fitting of steel wagon tire, regulation of clocks and watches for temperature.

Principles of sound illustrated in cornet, violin, piano, etc.

Differences of quality in different instruments.

Megaphone.

Phonograph.

Camera, projection lantern, head light, telescope, microscope.

Use of prism in lighting stores and basements by window and pavement construction, and in field glasses.

Colors of oil films, mother of pearl, tarnished brass, etc.

Electromagnet as a clutch, as a lifting device, as used in sounders and relays in telephony and telegraphy, and in electric bells.

Illumination of rooms.

Electroplating.

Magneto—in telephony, and in gas engines, high and low tension.

Induction coil, telephony, transformer, gas engines.

Lightning conductor construction.

Danger of wire fence to live stock.

4. At least two periods per week should be devoted to laboratory work, and these periods should be consecutive. Whether or not two periods are necessary for an experiment depends upon the amount of written work required in the laboratory as well as upon the character of the experiment itself.

5. In the laboratory the student shall perform at least 34 individual experiments and keep a careful notebook record of them; 20 of these experiments should be quantitative. The notebook will be required by the examiner.

Each of the 20 should illustrate an important physical principle and no two should illustrate the same principle. In no case should an experiment be selected which occupies more than two periods. Emphasis should be laid upon the conclusions to be derived and the discussion of the important features of the experiment. From 11 to 13 of the experiments should be in mechanics, and the remainder should be divided in approximately equal numbers among heat, electricity, sound and light. The selection of the experiments should be upon the most important topics.

Reference and Supplementary Books:

Cajorie; History of Physics.

Duncan; New Knowledge.

King; Physics of Agriculture.

Lynde; Physics of the Household.

Numerous Modern textbooks.

CHEMISTRY

One Unit

The course in general chemistry should extend throughout the year. A very satisfactory weekly program consists of two forty minute periods for class work, two double periods for laboratory work and a third double period (preferably on Friday), one period of which may be used for class work or both periods for laboratory work according to the condition of the work at that time. With this flexible arrangement it is easy to keep the class and laboratory work properly correlated.

The work comprises (1) Experiments performed and explained by the teacher, (2) Individual laboratory work on the

part of the pupil, and (3) Recitations and quizzes covering all phases of the experimental work as well as the supplementary study of text and reference books.

Naturally the view-point of the teacher will influence his selection of the text, and this will determine to a large extent the choice of materials and the sequence of study. There are several excellent high school texts. Directions for performing experiments are found in some of them, but it is more satisfactory to use a laboratory manual to guide the student in his experiments.

Neat and accurate records of all experiments should be made by the pupil, showing clearly the objects, the methods, the results, and above all his own observations, inferences and conclusions as to the nature of the phenomena he has produced and the meaning of it all. Pupils must not be permitted to infer that mere note book making is the end and aim of scientific study. This they are all too prone to do. On the other hand slovenly or careless work either in the performance of experiments or in recording the results should not be tolerated.

The examiner reserves the right to require that the note books be sent to him with the students' examination papers.

Before beginning the detailed study of chemical prenomena it is an excellent practice of many good teachers to indicate to the beginner at the outset something of the tremendous importance of the science in the development of modern civilization, and to impress upon him the fundamental relation of chemistry to industry as well as in the affairs of his own daily life. He should realize that Physics and Chemistry are absolutely fundamental to a rational knowledge of such sciences as Agriculture, Biology, Physiology, Sanitation, and Household Economics.

It is generally agreed that the study should begin with familiar forms of matter and familiar phenomena, but care must be taken to select phenomena that can be subjected to experiment and properly interpreted by the beginner. It is therefore necessary that the teacher should carefully consider the most natural method of approaching the subject and determine definitely the fundamentals which are to be the chief object of the instruction. It is also important that those who prepare examination questions should have clearly in mind these same fundamentals in order that the examination may fairly test the pupils' real insight and ability to interpret chemical phenomena, rather than his ability to memorize a wide range of facts from his text.

The essential considerations in the teaching of chemistry are well summed up in the following extract from the report

of the committee on chemistry for the Commission on Accredited Schools and Colleges of the Association of Colleges and Secondary Schools of the North Central States.

"(1) Technique of Experimentation.

Properties of common apparatus in respect to structure and material.

For example, how to make an apparatus air-tight and why.

Object of such operations as washing and drying gases, and how the object is attained.

Physical properties which may be used for recognition of each substance and for explanation of all observations.

Judicious use of proportions and materials.

Influence of conditions (temperature, homogeneous and heterogeneous mixture, etc.,) on chemical change.

(2) Physical Phenomena, their recognition, description and physical interpretation.

(3) The more strictly chemical application of the results.

For example, inference in regard to the nature of a chemical change which must have led to the result observed.

Making the chemical equation from adequate data.

The material basis for the above may be found for the most part in the employment of a restricted number of elements and a few of their compounds. Facts should be simplified and systematized by generalization, and generalizations ("laws") should be illustrated and applied to familiar things. The usual theoretical explanations should be given as facts accumulate. Laws and theories derive their importance from the facts, not visa versa and none should be given unless and until the corresponding facts have been encountered in laboratory or class room experiments."

An equipment for an elementary course in chemistry need not be very costly. A list of apparatus and chemicals needed and directions and drawings for arranging laboratory tables, sinks, water supplies, etc., where water and gas are not available, have been prepared by Dean E. J. Babcock, College of Mining Engineering of the State University and will be furnished by him free, on application.

Chemistry is so fundamental to the industries and activities of daily life and is so essential to a proper understanding of other sciences that it should be taught in every High School and generally elected by the pupils.

Reference:—

Duncan; Chemistry of Commerce.

Duncan; Some Chemical Problems of Today.

Brownlee and Others; Chemistry of Common things.

Dodd; Chemistry of the Household.
Wiley; Foods and their Adulteration.
Venable; A Short History of Chemistry.
Kahlenberg and Hart; Chemistry and its Relation to Daily Life.
Many Modern Textbooks.
United States Bulletins.

BOTANY AND ZOOLOGY

A knowledge of botany and zoology forms in part a proper basis for the study of agriculture, domestic science, human physiology, and physical education. Botany and zoology, therefore, should receive attention from all pupils in high school.

The outlines given below merely hint at what is to be done; any good textbook will suggest many necessary details.

These are courses in which there should be laboratory and field work. The examiner, therefore, will require notebooks, as evidence of laboratory work. The chief features of an acceptable science laboratory notebook are: (1) drawings and notes made from actual field and laboratory work,—it is practically useless to make copies of the texts and other books. (2) numerous, large, accurate, well executed and properly labeled drawings; (3) brief, well arranged, descriptive and explanatory notes; (4) a list of all laboratory exercises and field trips,—see page 16.

The time required for each of the four courses,—botany I and II and zoology I and II,—is three recitation periods and two double periods or the equivalent for laboratory and field work per week for eighteen or nineteen weeks.

EQUIPMENT SUITABLE FOR THE BOTANY AND ZOOLOGY LABORATORY

1. Tables at which pupils may sit and look into their microscopes and on which they may place their drawing paper. They should not be over about 29 inches high and while "kitchen" tables will do, they would better be about 4 ft. by 5 ft. or 5½ ft. These should be in a well lighted room.

2. In general there should be one compound microscope for every group of two pupils and a dissecting microscope for each pupil in the class. A school that will usually have a class of six should have three compound and six dissecting microscopes. Three compound microscopes in a small school should be sufficient. Some such instrument as the following are recommended: Bausch and Lomb compound microscope,

catalog number BH2, objectives 2-3 and 1-6, eyepiece 1½ inch, double circular microscope at about $30.50 to $33.00. The Barnes dissecting microscope Bausch and Lomb's Catalog number T1., 1 inch double lens, at about $2.50 to $2.75.

There should be dissecting needles. (These can be made by setting the eye of a common sewing needle into a soft pine stick about the size of a pencil); glass slips (slides); cover glasses; pipettes or droppers; a section razor (a common sharp,—but not too thin,—razor is satisfactory); dissecting knives; wide mouthed two-oz. or four-oz. bottles with stoppers; evaporating dishes of glass; glass jars; one or two bell jars; denatured alcohol or formaldehyde; reagents for testing for starch, etc.; notebook paper, sharp hard pencils, pen and ink, and pair of small forceps. There should be apparatus for germination of seeds.

3. If the school is not equipped for Chemistry, there should be such chemicals and equipment as are necessary to make tests for the purpose of defining oxygen, hydrogen, nitrogen, carbon dioxide, sulphur, phosphorus, etc.

4. Plant material should be collected during the summer and preserved in 50 per cent. to 60 per cent. alcohol or dilute formaldehyde. Some material may be had from the University, from the Agricultural College or from the Woods Holl Laboratory, Woods Hool, Mass., Mucor, saprolegnia and bacteria must be grown in the laboratory. Lilac-mildew and wheat rust and the smuts can be collected, as can horsetail and many others, if taken in season. Living material should be used whenever possible.

To be sure to have something at hand to work with it would be well to purchase 2-oz. bottles of fruiting Spirogyra, Nostoc, Vaucheria, Fucus, Callithamnion, Riccia, Marchantia, Mosses, Prothallia of Ferns, the sporophyte of Equisetum, Selaginella, Male and Female cones of white pine at the time of pollination, cones one year old, cones two years old (dry).

In like manner material should be had for zoology,—living if possible; but some will necessarily be in a preserved state and there should be a variety of such, so that the work may not be stopped when the living material can not be had. Living amoebae can be had by express, or mail, and much other fresh material may be had in that way.

There should be a few prepared slides (not many): One on the embryo of the fern, fertilization in White pine, embryo in White Pine, embryo-sac in the Lily or Iris and embryo in same. One of the cross-section of a leaf. Other material should probably be prepared in laboratory.

These will make a good beginning, but other things will probably be found to be needed.

Reference and Supplementary Books:
Chapman; Bird Life.
Conn; Bacteria, Yeasts and Molds.
Davenport; Domesticated Animals and Plants.
Davenport; Principles of Breeding.
Bailey; Plant Breeding.
Weed; Farm Friends and Farm Foes.
Snyder; The Chemistry of Plant and Animal Life.
Dodye; Nature Study and Life.
DeCandolle; Origin of Cultivated Plants.
Ganong; The Teaching Botanist.
Pinchot; A Primer of Forestry.
Hopkins; Soil Fertility and Permanent Agriculture.
Prudden; The Story of Bacteria.
Clodd; A Primer of Evolution.
Clodd; The Story of Primitive Man.
Lucas; Animals of the Past.
Many Modern Textbooks.
United States Bulletins.

BOTANY I

One-half Unit

If this course precedes Zoology I, the elementary study of oxygen, nitrogen, etc., should take place here. See Zoology I.

I. Introductory:—(a) Universality of plants in regions at all favorable to their growth. (b) Relative members of prosperous plants in deserts and extremely cold regions. (c) Plants upon trees and rocks and in caves. (d) Dependency of man upon plants,—1, for food; 2, Food for domestic animals; 3, Clothing; 4, shelter; 5, medicine; 6, paper; 7, fuel; 8, covering of the earth. (e) Plants not primarily to serve man,—timber, fruit, etc., first for their own uses. (f) Plants must work to live. (g) Plants must have materials and structure with which to work.

II. General Structure and Physiology of Plants:—(a) The cell,—cytoplasm, nucleus, plasmic membrane, sap cavity, wall. (b) Role of water in the plant,—osmose, path of transfer, transpiration, turgitity. (c) Photosynthesis,—function of chlorophyll, carbon dioxide, evolution of oxygen. (d) Respiration,—necessity of oxygen in growth, evolution of carbon dioxode. (e) Digestion,—digestion of starch with diastase and its role in the translocation of foods. (f) Irritability. (g) Growth, or assimilation.

Laboratory: Living material must be used for the study of this section. (a) The cell,—root hairs, hairs from the base of the leaf of "Wandering Jew," zygnema, spirogyra, (for

protoplasm) saprolegnia (water mold), epidermis and sections of leaves. (b) Osmose,—spiragyra, mucor, slices of beet or carrot, root hairs, longitudinal sections and cross sections of roots and stems (boxelder and corn). (c) Photosynthesis,—zygnema, spiragyra, sections of leaves. (d) Respiration,—Germinating seeds. (e) Digestion,—germinating seeds. (f) Irritability,—seedlings. (g) Notebook required,—see pages 16 and 56.

III. General Structure and work of higher plants:—(a) Roots,—structure, growth, kinds, uses. (b) Stems,—structure, growth, kinds, uses. (c) Leaves,—structure, arrangement, kinds, forms, uses. (d) Buds,—structure, kinds, arrangement. (e) Branches. (f) Flowers,—definition, parts use. (g) Pollenation. (h) Brief treatment of fertilization. (i) Seeds and their distribution. (j) Seedlings. (k) Conditions of germination.

Laboratory:—(a and b) Study of tissues of the stems of Box Elder and corn. Determine in general the difference between a stem and a root—externally and internally. (c) Additional study of structure of leaves. (d) Structure of buds. (e) Structure of typical flower. (f) Study pollen grain. (h) Germination of seeds.

IV. Ecology:—(a) Relation of plants to each other. (b) Relation of plants to water, soil, heat, light, wind,—plant societies.

V. Some relation of plants to commerce and industry: (a) Forrests; 1., Construction material; 2., Fuel; 3., Tree planting; 4., Forests and climate; 5., Forests provent erosion; (b) Plant breeding,—1., variation; 2., selection, wheat, corn, potatoes, etc. (c) Formation and preservation of soils. (d) Weeds.

BOTANY II

One-half Unit

I. The Great Divisions of Plants:—Some of the problems of this section are nutrition, reproduction, alternation of generations, theory of organic development, general principles of classification and economic value of plants. Distinguish between a spore and a seed.

(a) Algae,—1, Blue-green, (1) Nostoc, (2) Oscillacia. 2. Green Algae, (1) Spiragyra, (2) Zygnema, (3) Vaucheria. 3. Brown Algae, (1) Fucus. 4. Red Algae, (1) Callithamnion.

(b) Fungi,—1, Algae-fungi. (1) mucor, (2) saprolegnia. 2. Sac-fungi, (1) Lilac mildew,—microsphaera. 3. Aecidium-Fungi, (1) Wheat Rust. 4. Bacidium-Fungi, (1) Mushrooms, (2) Smuts. 5. Bacteria, (1) Forms, size and structure, mobility, reproduction, nutrition, relation to decay, relation to agriculture and gardening and other industries.

(c) Bryophytes,—1. Riccia, 2, Marchantia, 3, Mosses.

(d) Pteridophytes,—1. Ferns, 2, Equisetium, 3. Selaginella.

(e) Angiosperms,—1. Lily, 2, Leading families.

The laboratory work of this section is the structure, reproduction, and, in general, the life history of a typical plant of each subdivision.

II. Plant tissues: A detailed study of structure and functions of root, shoot, and leaf of angiosperms.

Laboratory: Longitudinal-sections and cross-sections of roots, stems and leaves.

III. Angiosperms continued: Seeds,—germination. Review physiology of young plant. Forms of stems and leaves. Flowers. Legumes as nitrogen gatherers.

Laboratory:—(a) Tests for starch, albumen, irritability, etc. (b) Nodules on roots of clover or alfalfa.

IV. Reproduction in lower plants and animals and in higher plants. 1, Spores, 2, Seeds. 3, "Struggle for existence." Inherited characters.

V. 1, Plant culture. (a) Spraying. (b) Disinfection. (c) Seed treatment. (d) Grafting. 2. Relation of plants to animals. (a) Food. (b) Diseases of animals caused by plants. 3. Value of plants to man. 4. Conservation of Forests.

Laboratory:—Exercise in grafting.

VI. Bacteria, yeasts, molds, rusts, smuts:—1. General notion of bacteria. (a) Those helpful to man,—especially nitrogen gatherers. (b) Those harmful to man,—especially those causing disease, as typhoid and yellow fever and tuberculosis. 2. Yeasts. (a) Structure and reproduction. (b) Their function in useful industries. 3. Bread and fruit molds. —saprolegnia.

ZOOLOGY I

One-half Unit

I. Very elementary study of oxygen, nitrogen, carbon, carbon dioxode, phosphorus, sodium, sulphur. Give these sufficient attention to secure reasonably clear notions of the substances.

Laboratory: Use any good manual of chemistry and such chemicals and apparatus as are necessary for testing these substances. Une notebooks,—see pages 16 and 56.

II. The lowest animals:—1. **Amoeba** or **paramoecium,** (a) Habitat. (b) Structure. (c) Food and methods of securing it. (d) Digestion and assimilation. (e) Reproduction. (f) Diseases caused by protozoans.

Laboratory: Select a suitable manual. Use compound microscopes. If specimens of the amoeba cannot be found in the vicinity, they may be had by mail or express. Paramoecia are found in one of the stages of an effusian of hay. Use notebooks.

III. The **hydra,** or other very simple **metazoan:** For its simple structure and simple life processes,—development of organs and division of labor—a simple form of sexual reproduction.

Laboratory: Use manual, dissecting and compound microscopes, and notebooks. If specimens cannot be found in vicinity, they may be had by mail or express. However, if the laboratory work in this section is found to be too difficut, it may be omitted.

IV. **Worms:** 1. Earthworm; (a) Habits, (b) General structure. (c) Food, digestion, and assimilation. (d) Reproduction. (e) Value to man. 2. Other worms, especially those causing disease.

Laboratory: Do completely the work outlined in some good manual. Use dissecting pans, scissors, and lens, etc., and notebooks.

Note: Care should be taken to teach throughout this course that animals are entitled to fair and kind treatment. Induce the pupils to read Black Beauty and another similar work.

V. **Insects:** 1. The Grasshopper. (a) An injurious insect. (b) Other Orthoptera. 2. May-flies and dragon-flies. (a) Metamorphosis of dragon-flies. 3. Bugs. (a) Water-bugs. (b) Cicadas. (c) Aphids,—means of destroying them. (d) Scale insects. 4. Beetles. 5. Butterflies and moths,—metamorphosis of Sphinx-moth. 6. Flies,—carrier of typhoid fever germs. 7. Bees,—economic value.

Laboratory: Study of structure, physiology, reproduction and life history of the grasshopper or locust as type of insects. Field work.

VI. **Amphibians:** 1. Study the frog as an introduction to vertebrates and to man as an animal. 2. The toad. 3. The salamander.

Laboratory: Do completely the work outlined in a good manual. Make drawings and notes. This work should include habitat, locomotion; skin, muscular system, nervous system, digestive system, circulatory system, skeleton, reproduction and metamorphosis.

VII. Read in class or out of class at least one good textbook of Zoology. In this reading cover the whole subject of Zoology for the purpose of getting a general view. Do some

field work in connection, (no Laboratory work) and make reports in notebooks.

Read supplementary books on protozoans, hydra, worms, insects and amphibians.

VIII. General classification of animals, including sub-classes of mammals, with examples of each class and sub-class. Valuable breeds for the farm.

ZOOLOGY II

One-half Unit

I. **A Sponge:** One or two days should be devoted to sponges. Behavior, habits and environment. Structure. Economic interests.

II. **Sea-Urchin or Starfish:** Two or three days should be spent on one of these,—the one of which specimens can more easily be secured. Habits; structure.

III. **Crayfish or Lobster:** Habits, Environment. Structure. Physiological processes. Man's economic interests.

Laboratory: Dissection pans and instruments. Dissecting microscopes. Use a good laboratory manual, and notebooks. If living specimens cannot be found in the vicinity, they may be had by express or parcel post. Preserved specimens should be among the laboratory supplies ready for use at any time.

IV. **Molluscs:** Clam or some other mollusc used as type Locomotion Feeding. Structure. Production of calcarious shell. Physiology. Reproduction. Habitat. Economic interests in some of the branch. Fossils of molluscs.

Laboratory: Use manual and work out the points mentioned above. Living specimens may be had by express, if they are not in the vicinity.

V. **Fishes:** The perch or some other used as a type form. Habitat. Locomotion. Food. Structure. Respiration. Reproduction. Divisions of the branch. Economic interests.

Laboratory: Use manual. Fresh specimens should be had. Secure by parcel post or express, if they are not to be found in the vicinity.

VI. **Reptiles:** Pupils should be taught that animals are entitled to fair and kind treatment. They should be taught to protect toads and most snakes, as they are of economic value as well as entitled to fair treatment.

If laboratory work is found to be difficult, it may be omitted. Field work can be done.

General study of reptiles,—classes harmful reptiles, fossil reptiles.

VII. **Birds**: 1, Field work,—habitat, flight, food, sociability, nesting, migration, songs, care of feathers, molting, senses, color. Recognition of common birds at sight or on hearing their notes.

Study of classes of birds, and of aesthetic and economic interests of man in birds. Names of valuable domesticated breeds of birds.

Laboratory: External and internal structure of the pigeon, using a good manual as a guide.

VIII. **Mammals**: General characters. Detailed study of a typical mammal,—the rabbit,—in field, laboratory and recitation room. External and internal structure. Characters of classes of mammals. Value to man. Most valuable domesticated breeds. What should be the character of man's treatment of same.

IX. Geological history of animals. Evolution of animals. The general principles of heredity.

X. Parasites and diseases caused by same.

PHYSIOLOGY

One-half Unit

A syllabus on this subject has been compiled by a special committee, a limited number of copies have been made, and one or more may be had by addressing the State High School Examiner, whose address is University, N. D.

A laboratory notebook will be required by the examiner.

Reference and Supplementary Books:

Conn; Yeasts and Molds in the Home.

Bigelow; Introduction to Biology.

Hoag; Health Studies.

Hough and Sedgwick; Human Mechanism.

Doane; Insects and Disease.

Gulick; The Efficient Life.

Dempster; Pathfinders of Physiology.

Sedgwick; Principles of Sanitary Science and Public Hygiene.

Many modern textbooks.

United States Bulletins.

GENERAL SCIENCE

A syllabus for work in this subject in the seventh or eighth grades has been compiled by a special committee. A limited number of copies may be had by addressing the State High School Examiner, whose post office is University, N. Dak. Laboratory notebook required.

PHYSIOGRAPHY

One or One-half Unit

The aim in physiography is to give training in scientific thinking and a knowledge of the relation and importance of the chief factors of the physical environment to man.

The outline includes only those facts and principles of physiography most essential for a high school course. Each topic should be so developed as to show the causes of the physiographic facts and their consequence in relation to life. The life effects should be brought in in each topic as treated so that the pupils may see each in its practical significance. Laboratory work should accompany and illustrate the study of the text and the recitation. Some field work should replace laboratory study in each autumn and spring. The student should be taught to apply, both in the laboratory and out-of-doors, the principles developed in the text and class-room. Notebooks containing a carefully written record of all laboratory work and reports of all field trips are a part of the required work of the course. Conference time for the discussion of these records and reports is advised. Ample equipment is essential. This should be as carefully selected for the special needs of the course as that of any other science.

Of the sub-topics presented, especial emphasis should be placed on the lands, less emphasis on the atmosphere, and the ocean should be treated briefly and from the standpoint of its relation to the land. The physiography of North Dakota is a brief type study of the state as a region to which the general principles of physiography are applied. The natural features are studied in regard to structure, origin, development, and their influence on the history and economic interests of the people.

The course in physiography should extend through the year, five days a week; about two-fifths of the time being devoted to individual laboratory work. When but one semester can be devoted to the subject, those topics with headings starred in the outline must be omitted and the remaining treated more briefly than in a full course. This short course, however, is not recommended.

Outline

*Introduction: The science of geography, physiography, importance of human geography, relation to other sciences and to history.

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*All subjects thus marked are a part of the second half unit.

The Earth

*The earth in space: The Solar System, the planets.

Form: Proofs, probable cause, consequences.

Size: Measurements, consequences.

Rotation. Evidences, day and night, direction, longtitude and time, latitude, navigation and surveying, effects on life.

Revolution: Evidence, rate, path, direction, effects.

Inclination of Axis: Change of season, length of day and night, apparent motion of sun, influence in life of man.

*Magnetism: Compass, magnetic poles, declination.

Maps: Projections, representation of relief, scales.

*Globes and Models..

The Atmosphere

Composition: Constituents and impurities and their relation to life.

*Height of the atmosphere.

Temperature: Source of heat; thermometers and their use; variation and their causes; isothermal charts of world; temperature distribution and range.

Pressure: Measurement by barometers; determination of altitude; relation to temperature; isobaric charts; distribution of pressure.

Circulation: Winds and their cause; instruments and methods of observation; classification of winds, their effects.

Moisture: Sources; Evaporation; measurement of humidity; fog and clouds and their causes; conditions and forms of precipitation; rain and snow; dew and frost; hail and sleet; measurement of rainfall; rainfall charts; distribution of rainfall; relation to wind systems; relation of moisture and rainfall to life.

Storms: Hurricanes and cyclones; characters; paths and rate; of North American storms; relation to general weather conditions; seasonal weather; local storms; protection from storms; weather maps and fore-casting; work of the U. S. Weather Bureau.

*Climate: Relation of weather to climate; factors of climate; climate elements and controls; characteristic climate of the zones; continental and oceanic climate; desert and mountain climate; changes of climate; relation of climate to life and to human industry.

The Ocean

General Characteristics: Divisions; form and depth of the ocean basins; composition, density and temperature of the ocean waters; topography and sediments of the ocean floor; effects on climate.

Movements of ocean waters: Waves, their causes and effects; currents; courses and rates of movement; causes and their proofs; influence of currents on climate and life; tides their nature and causes, variation and their causes, effect on navigation and harbors.

Life relations: A barrier and a highway; trade routes; the life of the sea; coral reefs; economic products.

The Land

*The Mantle Rock: Origin and importance; weathering; effects of heat and cold; frost action; wind work; the work of plants and animals; chemical changes.

*Soils: Relation to sub-soils and bed rock; fertility; kinds of soils and their origin; formation and removal of soil; soil erosion and its prevention; plant foods and fertilizers; soil water and temperature; conservation of the soil.

*The bed rock: Minerals and rocks; kinds of rocks and their origin; composition and structure of the rocks; alteration of the rocks; mineral products and their uses.

*The ground water: Occurrence and origin; the water table; movements of ground water; the work of ground water; caverns and cave life; springs and wells; artesian wells; ground water and health; dry farming.

Land forms: The interpretation and use of topographic maps; elevation and depression; the physiographic cycle; classification according to origin and topography; relation of the primary land forms, plains, plateaus, and mountains; secondary land forms.

Plains: Kinds of plains; Coastal plains—the Atlantic and Gulf plains, old coastal plains of the eastern interior; glacial plains, the prairies of the Middle West; Lake plains—the Red River Valley; alluvial plains—their formation and importance in history, the Mississippi plain; old plains of erosion—peneplains of New England and Piedmont; effects of climate and rock structure on the topography of plains; relation of life to different forms and climates of plains.

Plateaus: Stages in the life history of a plateau; young plateaus; dissected plateaus; old plateaus; broken plateaus; effect of climate and rock structure on topography of plateaus; canyons, mesas and buttes; life condition on plateaus.

Mountains: Classes of mountains; block mountains; folded mountains; domed mountains; complex mountains; life history of mountains; effects of climate and rock structures on mountain topography; mountain barriers and passes; forest reserves; life conditions in mountains.

*Volcanoes: Distribution; types of volcanoes; phenomena of eruptions; causes of vulcanism; history of volcanic cones; influence of volcanoes on topography and life.

*Movement of the Earth Crust: Changes of level,—along the coasts, in the interior; earthquakes, frequency and distribution, causes, destruction of life and property.

Rivers and Valleys: River systems and their water supply; life history of rivers; the work of rain and running water; valley development and surface topography; water falls and rapids; terraces, flood plains and deltas; revived rivers; dismembered rivers and drowned valleys; importance of rivers and valleys to man—navigation, power, irrigation and drainage.

*Lakes: Origin of lake basins and distribution of lakes; life history of lakes; relation to rivers; salt lakes; swamps; effects on climate and relation to life.

Glaciers: Nature of glacial ice; conditions necessary for glaciers; types of glaciers; the work of glaciers; ancient glaciers and ice sheets; contrast of glaciated and non-glaciated regions of North America; economic importance of glaciation in the United States.

Shore lines: Shores of oceans and lakes; types of shore lines; forms of elevation and depression; modification by waves, currents, tides, and rivers; harbors and their location; influence of harbors and coast lines.

*THE PHYSIOGRAPHY OF NORTH DAKOTA

A type study in regional geography

*Location: Boundaries and general relations.

*Weather and climate.

*Geological structure and its history.

*Topographic features: The three plains and their dividing escarpments; the glaciated and non-glaciated portions.

*The Red Rived Valley: Glacial Lake Agassiz; the Red River of the North; beach lines and deltas.

*The Drift Prairie: Glacial features; the Coteau des Prairies including Pembina "mountains;" Turtle "mountains;" and other residuals; the Mouse River Valley; Devils-Stump Lake basin; the Sheyenne, James and Pembina Valleys.

*The Great Plains: The Coteau du Missouri; the Altamont moraine and other glacial features; the "Bad Lands" of the Little Missouri; the Kildeer "mountains" and other buttes and mesas; the Missouri River and its valley.

*Economic physiography: Soils; lignites; clays; building materials; ground waters; streams and lakes.

*Life relations: Vegetation. animal life; native peoples.

Geographic influence in settlement and development: Exploration and settlement; the fur trade; farming and ranching; roads and railroads; location of cities and towns; manufacturing and mining; urban and rural relations; the relation of conservation to development.

REFERENCE AND SUPPLEMENTARY BOOKS

Todd: New Astronomy.
Russell: Rivers of North America.
Willard: The Story of the Prairies.
Wright: The Ice Age in North America.
Crosby: Common Minerals and Rocks.
Brigham: Geographic Infliuences in American History.
Davis: Elementary Meteorology.
Greely: American Weather.
Powell: Physiographic Regions of the United States.
Sutherland: The teaching of Geography.
Many modern textbooks
United States Bulletins.

ELEMENTARY GEOLOGY

One-half Unit

This outline includes the larger topics which should be presented in a half year's course in Geology, with five recitations a week. Field work should be given in place of several of these recitations in early autumn or late spring.

It is advised that this subject be not given except in high schools where the teacher is unusually well prepared in the subject and the locality offers special advantages or a suitable museum is provided. Under ordinary conditions the expansion of physical geography to a full year's work is preferred.

A laboratory notebook is required.

Outline

Introduction: Meaning and scope of geology and relation to other sciences, the geologic processes and agents.

I. Physical Geology

Composition of Earth: The atmosphere, the hydrosphere, the lithosphere.

Materials of the earth's crust: Minerals; rocks; igneous sedimentary, and metamorphic, mantle rock.

Original Structure of the Rocks: Igneous, sedimentary.

Structure Due to Movements: Warping, folding, jointing, cleavage, unconformity.

Alternation of the Rocks: Weathering, cementation, metamorphism.

The Works of the Atmosphere: Weathering, effects of heat and cold, frost action, work of plants and animals; mechanical work; transportation, deposition; chemical work, oxidation, hydration, carbonation.

The Work of the Ground Waters: The ground waters, movements of ground waters, springs and wells, mechanical work, chemical work.

The Work of Streams: Erosion, weathering, transportation, corrosion, deposition; valleys; the cycle of erosion, stream deposits.

The Work of Glaciers: Characteristics of glaciers, snow fields and ice fields, valley glaciers, Piedmont glaciers, ice sheets, ancient glaciers; the work of glacial ice, erosion, transportation deposition; the work of glacial waters; glacial deposits.

Land Forms: Plains, plateaus, mountains.

II. Historical Geology

The History of the Earth: Geologic and human history; fossils and their uses, divisions of geological time.

The Origin and Development of the Earth: The solar system; theories or origin, the nebular theory, the planetesimal theory.

A survey of historical geology.

- Archean Era.
- Algonkian Era.
- Paleozoic Era.
  - Cambrian Period.
  - Ordovician Period.
  - Selurian Period.
  - Devonian Period.
  - Carboniferous Period.
- Mesozoic Era.
  - Triassic Period.
  - Jurassic Period.
  - Cretoceous Period.
- Cenozoic Era.
  - Tertiary Period.
  - Quaternary Epoch.
    - Glacial Epoch.
    - Recent Epoch.

BACTERIA, YEASTS AND MOLDS

One-half Unit

This study is introduced into the agricultural and domestic science courses because of its close affiliation with the basic ideas of these subjects. The study of sanitation, prevention of disease, theories of the origin of disease, etc., is of fundamental importance to all classes of students.

For the student of domestic economy, the course should include more particularly:

(1) Microorganism as a whole, their uses as well as their dangers.

(2) a. Molds; common types occurring in the household such as Pencillium, Aspergillus, Mucor, Cepalothecium. Simple form and structure (morphology and histology) of these forms.

b. Occurrence of such molds in the home on such foods as bread, cheese, fruits, etc. Changes, both chemical and physical produced by such molds.

c. Preservation of such foods from moulding, by canning, cold storage, sulphuring, etc., with examples.

d. Factors favoring mold growth with practical examples of economic importance (light, heat, moisture, etc.)

(3) a. Bacteria, form, size, method of motion, growth Physical and chemical factors favoring bacterial growth.

b. Saprophytic bacteria, disintegration, products of fermentation, decompostion, ptomaine formation, vinegar manufacture, cheese and butter "tastes," necessity for garbage disposal, preservation of foods from bacterial action with distinctions from (2c). Preservations, hamless and poisonous, with examples.

c. Clean milk. Structural reasons for its early decomposition by bacteria. Precautions necessary to be observed for the production of a clean product. Pasteurization, its favorable and unfavorable points.

d. Parasites, toxin formation, virulence and attenuation. Methods of exit from patient, of transportation from host to host. Methods of channels of infection with examples. Specific carriers of disease, water, milk, insects, air and dust, "carriers."

e. Water supplies: Farm springs and wells. Precautions of construction of a well, such as casing, curbing, cover, drainage, etc. City and town water supplies, artesian wells, impounding reservoirs, filters and bacteriological precautions to be observed in each.

f. Immunity, antitoxin formation, opsonins, vaccines with explanations in simplified language.

g. Fumigation and use of antiseptics and germicides. Efficient methods of use of the various agents is to be emphasized.

(4) a. Yeasts, morphology and structure growth.

b. Uses, fermenting agent for alcohol production and raising of bread. Action of yeast anzymes on carbohydrates, diastatic, inverting and zymatic.

c. Unfavorable action of yeasts on sugar solutions such as jellies.

d. Method of testing yeast activity and use of pure cultures.

For agricultural students the course should be supplemented or altered to fit the class. Almost all of the above outline will be useful. The following, however, should be added or substituted in its proper place:

1) Batcriology of soil. The nitrogen cycle with its various activities such as demtrification, humus formation, ammonia formation, nitrification, etc. Legume nodules, soil inoculation, its benefits and reasons for failure to act in special types of soil. Zones of depth as regards bacterial growth in soil. Numbers of bacteria in soil.

The sulphur and carbon activities of soil forms.

(2) Mycology of higher plants and soil. Meaning of plant pathology and soil "sickness." Instance of plant diseases such as scab of potatoes, wilt of flax, smuts of wheat. How they tend to increase in the soil thru means of the rubbish of the preceding crops, and thus bring about infection of the growing crop thru the waste materials of the previous crop.

(3.) Pure cultures and methods of making and using them. Some training should be given to the students in the proper preparation of simple culture media, test tube purification, petri dish purification and sterlization of the media. Exercises in this work will teach the pupil how difficult it is to keep ordinary household utensils and other supplies free from growths of microrganisms.

It should be especially emphasized also that technical terms are in so far as is practicable, to be substituted by simpler forms of wording for this course. This subject can be made either very dull to this class of pupils by use of strictly technical phrases, or extremely live and interesting by popular language.

Laboratory notebooks required.

Reference,—

Conn, Agricultural Bacteriology. P. Blakiston & Co.

Conn, Practical Dairy Bacteriology. Orange, Judd & Co.

Jordan, Manual of Bacteriology. Saunders & Co.

Lipman, Bacteria in Relation to Country Life. Macmillan Co.

Prudden, Dust and Its Dangers. Geo. Putnam's Sons.

Prudden, Story of the Bacteria. Geo. Putnam's Sons.

Prudden, Drinking Water and Ice Supply; Their Relation to Health and Diseases. Geo. Putnam's Sons.

Marshall et al., Microbiology. P. Blakiston Son & Co.

Conn, Bacteria, Yeasts and Molds in the Home. Ginn & Co.

AGRICULTURE

One Unit

The unit course in agriculture has been completely outlined in a syllabus compiled by a special committee. Besides the outline there are a student's laboratory manual, a list of suitble equipment, a list of usable text books, and a list of reference and supplementary books and pamphlets. The outline makes special reference to these books and pamphlets.

The syllabus has been printed and well bound, and may be had by addressing the Examiner, University, N. D., and enclosing 15 cents per copy.

Laboratory notebooks required,—see page 16.

HORTICULTURE

One-half Unit

Horticulture is related to both botany and agriculture, but in both science and practice it differs from each.

As a science, horticulture deals particularly with plants as related to heat, light, moisture and plant food and also with plant improvement through crossing and selection.

As an art, horticulture deals with the many kinds of plant manipulation, such as, transplanting, pruing and propagating in its many forms.

The agriculturist treats his plants as a crop or en masse.

In horticulture practice, the individual plant generally receives consideration.

The horticulturist aims to exercise a more perfect control over his plants than is possible in most lines of agriculture.

Among the things he seeks to attain, are: Size, earliness, fruitfulness, quality and ornamental effect. The methods by which these objects are attained should constitute a large part of the instruction in horticulture.

The work may be done through the means of lectures and text books with a sufficient amount of observation to fix the points well in mind.

Notebooks required,—see page 16.

The following general topics will receive attention:

The order in which they should be taken up will depend upon the time of year in which the topic is studied.

First: Germination. The conditions necessary for germination and the means of obtaining such conditions in garden practice should be illustrated by concrete examples. Note the development of the plantlet as influenced by the amount of heat, light and moisture.

Second: Roots. Determine by experiment what conditions favor the growth of the roots of plants; study the different types of roots with reference to needs of the plants, and to the processes of transplanting.

Third: Leaves. Determine the relation between leaf development and fruitfulness what factors control leaf development?

Fourth: Buds. Note the difference between leaf buds and fruit buds. Note at what season of the year the fruit buds are formed and what treatment of the plant favors their development.

Fifth. Plant Reproduction. Note the different methods by which plants reproduce themselves and the advantages of each. Study all the different processes of artificial plant propagation. Practice grafting, budding, layering, etc.

Sixth: Plant Improvement. (1) Study the processes of crossing and selecting and their effects, fruitfulness, quality and ornamental effect.

Seventh: The Work of Plants. Study the relation of plants to heat, light, moisture and plant food.

Eighth: Plant Culture. Learn what fruit and vegetable crops can be grown in your locality and the necessary conditions for success.

Reference,—

Bailey, Manual of Gardening.

Goff, Principles of Plant Culture.

Green, Vegetable Gardening.

Green, Fruit Growing.

MANUAL TRAINING

Two Units

Industrial subjects should be pursued by the pupils of the elementary grades in form of paper cutting, weaving, clay moulding, braiding, basketry, freehand drawing, sewing, sloyd, etc. In the sixth and seventh grades the girls should do some systematic work in sewing, and in the eighth grade, a course in cooking. In the sixth, seventh and eighth grades the boys should do bench work, etc. The work in freehand drawing should continue through the grades.

Definition.—Manual training is defined by the American Manual Training Association as any form of constructive work that serves to develop the powers of the pupil thru spontaneous and intelligent self-activity. Manual training includes freehand and technical drawing; working in wood and metal; modeling in sand, clay or plaster; casting plaster or metal; domestic science; cooking; dressmaking; paternmaking; printing; Swedish sloyd; Russian tool practice; etc.

Purpose.—Its purpose is to educate the **mind** thru the **hand.**

Grade 7

Time: One hundred minutes a week in two periods.

Projects: Woodwork.—Simple construction involving the four principal cutting tools—saw, plane, chisel and spokeshave and the necessary laying out tools. Measuring, squaring board and game board. Planing (surface and edge cutting board). Vertical chiseling, gouging, paring, sharpening chisel making rack for brushes, tools or brooms and making pen tray. Bow sawing, modeling, sandpapering in making coat hanger, etc. Halving; nailing; finishing in making flower pot stand, bracket shelf, water wheel, etc., involving some form of groove joint.

Grade 8

Time: Two hours a week in two periods.

Projects: Woodwork.—Construction involving groove joint—towel roller and sleeve board. Exact work in plaining, to make glue joint—bench hook, drawing board. Review of "form work" with more difficult modeling—hammer handle, canoe paddle. Mortice and tenon joint—taboret, plant stand, book shelves. Carving—book rack, ends carved from original designs, form of joint for ends chosen by pupils.

High School

Two units of work in manual training are offered in the high school. A syllabus of this work may be obtained by applying to the High School Examiner, University, N. D.

No pupil shall be eligible for the second credit in manual training without taking at least one-half credit in mechanical drawing. The courses in mechanical drawing are strongly recommended to all students taking any work in manual training.

No examination in manual training will be offered by the High School Examiner. The instructor in manual training shall report in full, to the Examiner, what work has been done by each pupil in manual training, his estimate of the quality of such work, the nature of the examination passed by the pupil, and the credit allowed on it.

Double periods of 80 to 90 minutes are urged in preference to single periods. In schools where this arrangement is not feasible, single periods will be permitted; and the classes may thus finish one-half unit each year.

HOUSEHOLD ECONOMY

(Domestic Science and Art.)

Four Half Units

Syllabi of these courses have been compiled by a special committee and a limited number of copies is ready for mailing. Those who have use for these may secure copies by addressing the state High School Examiner, University, N. D.

The time required for a unit of credit is five double periods per week for thirty-six weeks. It is intended that Course I, in either domestic science or domestic art will be accomplished before Course II, in either is attempted. Domestic Science I. and Domestic Art I. may alternate with each other through a year of thirty-six weeks, or they may be done separately in succeeding semesters of eighteen weeks each. Domestic Science II. should follow or accompany, if possible, the high school courses in physiology, botany, bacteria, yeasts and molds, and chemistry. Domestic Art II. may be done at any time after domestic Art I. is completed.

The work outlined under textiles is intended to be given with the sewing and in the same periods. The part dealing with vegetable fibres should be given with Domestic Art I. and that dealing with animal fibres with Domestic Art II.

In order to save time that will otherwise be lost in beginning and closing, all periods of work in domestic science and art should be double periods.—See Sec. 13, page 16.

MECHANICAL DRAWING I

First One-half Unit

One period a day throughout the year or two periods a day for one-half year.

The purpose of the course in the first year of the high school is to teach the pupils to make and read working drawings and sketches, to give a knowledge of geometric construction in its relation to mechanical drawing, to produce skill in the use of instruments by means of drills in the making of drafting conventions, to train the imagination and the power to visualize by teaching the fundamentals of projection.

GROUP I	PROBLEMS SUGGESTED
Free hand and mechanical lettering—Emphasis on placing, form, slant, spacing, texture of line.	Gothic alphabets and figures. Upper case and lower case letters.
GROUP II	
Geometric construction—Use of T-square, triangles and instruments in constructing geometrical figures.	Lines, tangents, angles, triangles, square, circle, pentagon, hexagon, octagon, etc.
GROUP III	
Conventional lines—Use of T-square, triangles, and instruments in drawing the different lines used in mechanical drawing.	Exercise sheets in lining. Visible edge lines, invisible edge lines, center lines, projection lines. construction lines, dimension lines.
GROUP IV	
Simple mechanical drawing—The different views of objects involving the use of straight lines, circles, and tangents. Free hand mechanical drawing.	Rectangular frame, box, try square, flower pot, circular box, face plate, desk tray, link stool, taboret, etc.
GROUP V	
Orthographic projection—Three views of geometrical figures. Resolutions. Developments. Intersections.	Rectangular prism, hexagonal prism, pentagonal prism, triangular pyramid, pentagonal pyramid, waste basket, stove pipe section, funnel, etc.

MECHANICAL DRAWING II

Second One-half Unit —

One period a day throughout the year, or two periods a day for one-half year.

The purpose of the course in the second year is to produce better technique in drawing, to develop an appreciation of constructive design, to give the student a working knowledge of the sketching and drawing of machine details, give a drill in tracing and blue printing, and to teach the questions and problems to be considered in the planning of a dwelling.

GROUP I	PROBLEMS SUGGESTED
Problems for manual training shops involving constructive designs.	Book rack, shelves, stool, chair, table, gravel, box, tray, napkin holder, etc.
GROUP II	
Isometric and cabinet (oblique) projection.	Cube, cylinder, hexagonal prism, pentagonal prism, mortise and tenon joint, stool, saw-horse, cabinet projection of some of the problems under Group I.
GROUP III	
Representation of screw threads, bolts and screws.	The helix, sharp V thread, U S. standard thread, square thread, acme thread, bolts, set screws, machine screws, etc.
GROUP IV	
Working drawings of machine parts—Detail and assembled drawings, tracing,-blueprinting.	Wrench, pully, coupling, connecting rod, shaft, bearing, globe valve, steam pump, etc.
GROUP V	
House and barn Drawing—Style of roof, rooms needed, arrangement of rooms, beauty of exterior, tracing and blueprinting.	Cottage and two-story house. Floor plans, elevations, roof plans, details of cornice, water table, doors windows, staircase, fireplace, etc.

Reference: Problems in Mechanical Drawing, by Charles A. Bennet, The Manual Arts Press, Peoria, Illinois.

Course in Mechanical Drawing, Junior, Intermediate and Senior, by Thorne. The Williams Brown Earl Co., Philadelphia.

Elements of Mechanical Drawing, by Gardner C. Anthony. D. C. Heath & Co., Boston, Mass.

Applied Mechanical Drawing, by Franc E. Mathewson and Judson L. Sewart. The Taylor-Holden Co., Springfield, Mass.

Notes for Mechanical Drawing, by Frank E. Mathewson. Manual Arts Press, Peoria, Ill.

The Essentials of Lettering, by Thomas E. French and Robert Meiklejohn. Manual Arts Press, Peoria, Ill.

Mechanical Drawing and Elementary Machine Design, by John S. Reid and David Reid. John Wiley & Sons, New York City.

FREEHAND DRAWING

One-half Unit

One year, forty-five minutes per day, one-half unit of credit.

The aim is two-fold (1) an understanding of the fundamental art principles, (2) the acquisition of the ability to express that knowledge thru drawing and painting.

The work falls under five main heads.

I. The study of the Principles of Design (balance, rhythm, and harmony). Specific problems illustrating each principle should be worked out, at least one being applied. The universal application of the principles should be continually pointed out.

II. The study of the Perspective. The study should include parallel perspective, angular perspective and oblique perspective.

III. The Representation of Still Life Groups in Pencil and Charcoal. Aims (1) good composition; (2) good character of forms; (3) a correct representation of values; (4) good technique. For charcoal work read page 28 "Art Education for High schools." In pencil drawing aim for a simple rendering of larger values in broad definite strokes which keep the same direction. Use soft pencil and avoid working over a mass more than once. For illustrations see "Applied Arts Drawing Books," edited by Wilhelmina Seegmiller and "Progressive Lessons in Art Education in High Schools," published by Prang.

IV. The Painting of Nature Studies. Aims (1) good character in form and color; (2) rendering of light and dark values seen in leaves, stems and flowers; (3) direct water-

color handling. In order to secure the last aim lift the color from the cakes and allow them to mix in the brush and on the paper (not in the lid of the box) thereby producing a variety of color and brilliancy of effect. Work in mass (never outline first) with the flat side of the brush rather than the point. Never work over a color.

V. Study of Landscape: Refer to Seegmiller's "Applied Art Drawing Books" and "Art Education for High Schools." The following books are suggested for reference:—

"Arts Education in High Schools, published by Prang.

"Applied Art Drawing Books," edited by Wilhelmina Seegmiller.

Batchelder, E. A.: The Principles of Design.
Batchelder, E. A.: Design in Theory and Practice.
Sanford, F. G.: The Art Crafts for Beginners.
Branch, E. A.: Illustrated Exercises in Design.
French & Mieklejohn: The Essentials of Lettering.

VOCAL MUSIC

One-half Unit

In presenting the courses for vocal music in the High School, it is assumed that the course of eight years in vocal music in the grades or its equivalent has been completed. Unless such preparation has been made, the High School course should not be attempted. (To offset this lack of preparation a three-year course might be offered in the High School as preliminary to the regular course.)

The purpose of the Vocal Music Course is to cultivate a better taste for good music by participating in singing the best choral works, to gain greater ability to read music intelligently and sing in parts independently. The course should include a thorough review of notation, including the scale, both major and minor, key signatures, notes and rests of various lengths, intervals, terms as applied to musical expression, exercises in sight singing and writing music from dictation.

There should be developed a familarity with such choruses and composers as:

Soldier's Chorus (Faust) ..... Gounod
Pilgrim's Chorus (Tannhauser) ..... Wagner
Anvil Chorus (Il Trovatore) ..... Verdi
Gypsy Chorus (Bohemian Girl) ..... Balfe
Hallelujah Chorus (Messiah) ..... Handel
The Heavens Are Telling (Creation) ..... Hayden
'Tis Thy Wedding Morning (Rose Maiden) ..... Cowen

Gloria (12th Mass) ..... Mozart
Serenade ..... Schubert
Lost Chord ..... Sullivan
How Lovely are the Messengers (St. Paul) ..... Mendelssohn

Standard hymns and patriotic songs should be sung with special attention to phrasing and other means of bringing out the thought.

PENMANSHIP AND SPELLING

One-half Unit

Part of the Sixteenth Unit

Very little if any writing should be done in copy books in high school. In fact, if an instructor is qualified to put the copies on the blackboard and direct the pupils in their practice, much better results may be obtained by the use of loose practice paper than with the copy book. The forearm, or "muscular" movement, should be cultivated and for this purpose the teacher and pupils will find a great deal of helpful material in such publications as the Penman's Art Journal, the American Penman, and The Business Educator.

The words in the exercises in spelling should be those commonly used in correspondence, in reporting and in business.

The examination of the high school examiner will require a specimen of the pupil's handwriting and the spelling of difficult words in common use with emphasis on those used in business.

BOOKKEEPING

One-half Unit

This course should include a thorough drill in the elements of bookkeeping and practice in the use of the more common books of accounting, such as day book, journal, cash book, sales book, check book, ledger, bills receivable and bills payable book, and trial balance and statement book. Some single entry might be given, but most of the work should be done in double entry. Students should be required to fill out and become familiar with such business forms as invoices, notes, drafts, checks, receipts, statements of account, etc., and a system of instruction which requires these papers to be made out for the transactions entered in the books of account is to be preferred to one which does not require them.

One Unit

The full year course in bookkeeping should include, in addition to the work outlined for the half-year course above, advanced work in bookkeeping and business forms, either by

independent individual sets for the pupils or by organizing the class into a community for business practice with some suitable guide for the transactions to be performed and the books to be kept. In the latter method care should be taken to hold the pupil strictly to the work in hand, and to a high standard in business forms and books of account, lest time be wasted in useless "dickering." All transactions should be carried out by correspondence, thus reducing confusion to the minimum.

COMMERCIAL LAW

One-half Unit

The following from the report of the Commission of the North Central Association of Colleges and Secondary Schools will serve as a guide:

Study the legal principles governing business relations, especially contracts, their nature, essentials, and effects; further sales, interest and usury, bills and notes, agency, partnership, corporations, real property and mortgages, liens attachments, surety and guarantyship, bailments, common carrier, banking, fire insurance, landlord and tenant.

Text book, supplemented by some study of cases (by way of illustration), discussions, and practice in drawing legal papers such as a contract, note, bill of exchange, bill of sale, bill of lading, power of attorney, deed, mortgage, lease, notice of protest, etc.

HIGH SCHOOL GEOGRAPHY

One-half Unit

The object of this course is to give the pupil a practical insight into geography. It should enable him to see the relation existing between the different phases of the subject. This is necessary not only for one who enters into business life, but for one who intends to teach geography.

Geography in this course should be taught so as to enable the pupil to see the influence the physical features have upon the industries and life of a people. Second ,it should be made clear that an equally important matter is the government of a country. This course, therefore contemplates a union of the physical, the political, and the economic phases of geography.

The following outline of work is suggested:

I. Review of the 7th grade geography—
Motions of the earth and consequent results;
Map drawing of the different continents;
Brief review of tides, ocean currents—atmosphere.

II. Physical features of principal countries—
Physical features of the chief commercial countries,—those affecting the life and industries of a people;
Formation of soil, coast-lines, river systems;
General topography;
Detailed study of North Dakota with special attention on the results of glaciation.

III. Political divisions—
Brief study of the governments of the leading commercial nations of the world with map of each;
Characteristics of people;
Immigration and migrations of people—special reference to the U. S.—and the results.

IV. Economic Geography—

A. United States.

1. Plant and animal products;
2. Natural resources—mineral, water, forests, etc.;
3. Tendencies towards centralization and concentrations with their causes and results.
4. Centers of industries, reasons and location.
5. Transportation.
Waterways, railroads, merchant marine, canals, operation, communication.
6. Government.
How it affects our industries—tariffs, legislative regulation, recent economic legislation.
7. Commerce—imports, exports and domestic commerce.

B. A similar but not extensive treatment should be given to the leading nations of the world.

C. International rivalries in commerce.

List of References:

High School Geography—Dyer—American Book Company.
Commercial and Industrial Geography, Keller & Bishop, Ginn & Co.
Commercial Geography, Brigham, Ginn & Company.
History of Commerce, Clive Day, Longmans, Green & Company.
Physical Geography, Davis, Ginn & Company.
Consular Reports, Washington, D. C.
Year Book.
Statistical abstract.

SHORTHAND

Two Units

No credit should be given for work in shorthand unless the pupil takes typewriting in his course also. It is very desireable that pupils in shorthand pursue this study for two years. At the end of that time the student should be thoroughly equipped to do any ordinary stenographic work. This is a subject that requires close application and should not be pursued in the hope of finding it a snap course. These units require as much work as others of the high school course.

For stenographic work the student should pursue a full four-year high school course; as stenographers are expected to possess broader scholarship than a special preparation in shorthand and typewriting. In fact, it would be better in most cases if the pupil were to pursue these special lines after completing this four years of high school work.

First Unit

During the first year of the work in shorthand thoroughness should be considered more important than speed. The principles of the system taken up should be thoroughly mastered and extensively reviewed. Drill on rules and their application Study word-signs, and abbreviations; and drill on sight reading. Shorthand plates, read and transcribed.

Second Unit

Some advanced dictation course suited to the system of shorthand taught.

Shorthand penmanship drill.

Business letters and legal forms, practiced and dictated.

Shorthand plates, transcribed, practiced and dictated.

By end of the year, acquire speed on new matter of 85 to 100 words per minute.

TYPEWRITING

One Unit

In typewriting, what is known as the touch system should be taught. By this method the pupils learn to use their fingers in operating the machine and keep their eyes off the keys. Celluloid caps may be fitted over the keys or a shield may cover the keys and operator's hands to assist in acquiring this method.

Thorough training should be given in the care of the machine, in manifolding and tabulating.

As much of the practice and drill work in typewriting may be, and often is, done within the eighty-minute periods given by the same pupil to shorthand, and as this is done in some of our best schools with success, as to the results, in both the shorthand and typewriting courses, forty minutes per day during the year for additional practice in typewriting seems to be right, and therefore, one unit of credit is the right amount to be allowed for the two years' work in typewriting.

First Half-Unit

Finger exercises.

The lessons of the text book should be completed. The first object in this work is accuracy. The lessons when completed should be fastened together with a proper title page and should be neat and accurate throughout.

Machine dictation.

Transcription of shorthand plates.

Second Unit

While maintaining the accuracy required in the first year the pupil should strive to acquire speed throughout the second year's work.

Transcription of business letters, new dictation that was dictated at 75 to 100 words per minute.

Copying, 40 words per minute.

PSYCHOLOGY, ELEMENTARY

One-half Unit

This part of the course deals, in an elementary way, with the facts and theories of general psychology. Its aim is to introduce the pupil to a study of his own mental states as a preparation for the sympathetic and intelligent observation of the lives of others.

PEDAGOGY, SCHOOL MANAGEMENT AND SPECIAL METHODS

One-half Unit

A discussion of the common problems of school management and rational methods of teaching the various subjects found in elementary school programs. The class should, under the direction of the teacher, make frequent visits to the grade

rooms to observe how the methods under discussion are put into actual operation. Pupils should make a full report of such visits. The direction work should be made an important feature during this semester .

ARITHMETIC—HIGH SCHOOL

One-half Unit

The aim in this course is a thorough knowledge of the essentials of arithmetic. This course should result in accuracy, rapidity, neatness, a reason why, and the ability to state that reason in good English.

One-half of the time should be given to rapid oral work and to the statement of definitions and principles. Each written exercise should be done under a time limit and accurate work only should be accepted.

This course includes notation by the use of Abrabic characters and Roman numerals; numeration,—the reading of decimal fractions through millionths at sight; a general discussion of reduction; scale as used in different phases of arithmetic; the fundamental processes in whole numbers, decimal fractions and in common fractions in which the denominator is 2, 3, 4, 6, 8, 12, and 16; the multiplier, abstract, etc.; aliquot parts and short methods in multiplication and division; statement of fundamental principles and definitions daily rapid oral work in addition; tests of divisibility; factors; multiples; powers and roots of small numbers; commercial statements and commercial paper; time, circular, linear, square, cubic and capacity measures, avoirdupois weight; board measure; plastering, carpeting, etc.; the more elementary phases of longitude and time; the three cases in percentage,—to find any per cent of any number,—to find a number when a certain per cent is given,—and to find what per cent one number is of another; reduction of any per cent to a common fraction or decimal fraction; commercial and bank discount; taxes; insurance; interest and interest tables; square and cube root; measurement of surface and solids, including cones, cylinders and spheres; elements of the metric system; problems involving purchase by the ton and by the thousand, and problems in measurement and percentage.

This course does not include: addition, subtraction, multiplication and division of denominative numbers; tables of English money and troy and apothecaries' weight; surveyors' measures; averaging accounts; stock-jobbing; U. S. securities; gold investments; compound proportion; custom house business; partnership; duodecimals; arithmetical and geometrical progressions; alligation.

This course in arithmetic is designed to take the place of the commercial and senior-review courses offered formerly, and only one set of questions for arithmetic, done in the high school is designed to be offered. It is believed that the teacher can give the subject the commercial or pedagogical viewpoint, as local conditions may require.

SENIOR GRAMMAR

One-half Unit

The aims of senior grammer are similar to those of senior arithmetic, viz: Comprehensive and intensive study of the subject for such a mastery as was impossible four years before, and also the phase of the subject needed by the prospective teacher in presenting it to his classes.

If the teacher is masterful and independent of any particular book, it would be profitable to spend the semester on work devised or chosen from various sources, and then, under the direction of the teacher have the pupils investigate the assigned lesson in various texts kept on the shelves or in their own possessions. This would give rise to differences of view and, with a skillful teacher, to reconciliation later on. As in arithmetic, every topic of grammar should be investigated, but the fundamental principles should not be lost sight of in discussion over minor and merely formal details. Grammar should be built up, or developed as other sciences in accordance with inductive procedure—examining and classifying materials as in chemistry or botany. It is a thought subject par excellence. The emphasis should, of course, be laid on the sentence analyzed into its various parts, and on the kinds and relations of these parts.

COMMON SCHOOL SUBJECTS

The state high school examiner offers examinations in arithmetic; English grammar and composition; the history of the United States; geography; reading, spelling, and penmanship. These examinations are designed for pupils who have completed the eight grades of the common school course and desire to enter the high school. The examinations in arithmetic; English grammar and composition; history, and geography will require no further comment than that they will cover the work that is usually done in these subjects in the grammar grades. Reading, spelling and penmanship will be treated in a single paper in accordance with the following plan:

The examination in reading will be based upon a portion of the literature that is read in the grammar grades of our schools, namely, upon:

1. Evangeline. 2. Tom Sawyer. 3. The Hoosier Schoolmaster. 4. Rip Van Winckle. 5. The Vicar of Wakefield. 6. Grandmother's Story of the Battle of Bunker Hill. 7. Napoleon, The Little Corsican. 8. The Great Stone Face. 9. The Sandpiper, (Thaxter). 10. Breathes There a Man, (Scott) 11. Columbus, (Miller). 12. Recessional, (Kipling). 13. Psalms XIX and XC. 14. Lincoln's Gettysburg Speech. 15. Battle Hymns of the Republic. (Howe).

The pupil's scholarship mark in spelling will be determined from his answer paper in the subject of reading; provided that the examiner may supplement this test with a list of words selected for the purpose from the literature named above, but no rare or unusual words shall be included in such list.

This answer paper will also serve as a specimen of the pupil's penmanship and will determine his grade in that subject.

In addition to studying the subject matter of what is read for the purpose of getting the author's meaning, pupils should give careful attention to distinct pronounciation and a pleasing and effective oral expression of the thought. This should constitute an important feature of all school work in reading, but in the nature of the case it is impossible to give it proper recognition in a written examination. It is therefore suggested that the superintendent of the school supplement the high school board examination with an oral test that shall show the pupil's skill in reading aloud.

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